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MASSACHUSETTS
CROP REPORT

FOR THE

MONTH OF MAY, 1904.

GRASS CULTURE.

ISSUED MONTHLY, MAY TO OCTOBER, BY STATE BOARD OF
AGRICULTURE, STATE HOUSE, BOSTON, MASS.

J. LEWIS ELLSWORTH, *Secretary.*

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CROP REPORT FOR THE MONTH OF MAY, 1904.

OFFICE OF STATE BOARD OF AGRICULTURE,
BOSTON, MASS., June 1, 1904.

Bulletin No. 1, Crop Report for the month of May, our first monthly crop bulletin for the year, is presented herewith. These bulletins will follow the usual lines for this year, so far as at present arranged for, with statistics regarding the crops of the country, followed by notes on the weather conditions in New England and the United States at large, a summary of crop conditions compiled from the reports received from our numerous correspondents, selected reports of correspondents, and finally an article on some subject of interest to our farmers by a recognized expert in the line treated on. Suggestions for improvement in form and substance matter will be gratefully received. An article on "The hay crop in Massachusetts," by Prof. Wm. P. Brooks, professor of agriculture at the Massachusetts Agricultural College, will be found printed at the close of this bulletin. Professor Brooks has given this subject very careful consideration, and it is one that should appeal to all thoughtful farmers. Intensive cultivation is the secret of success on our New England farms, and applies as well to grass culture and the care of mowings as to the management of market gardens.

PROGRESS OF THE SEASON.

The May returns to the Bureau of Statistics of the United States Department of Agriculture (Crop Reporter for May, 1904) show the area under winter wheat in cultivation on May 1 to have been about 27,083,550 acres. This is 4,932,700 acres, or about 15.4 per cent, less than the area sown last fall, and 5,247,000 acres, or 16.7 per cent, less than the area of winter wheat harvested last year. The

average condition for that remaining under cultivation was 76.5, precisely the same condition as that reported for the total area sown on April 1, against 92.6 on May 1, 1902, 76.4 the year previous, and 84.2, the mean of the May averages of the last ten years.

The average condition of winter rye was 81.2, as compared with 82.3 on April 1, 93.3 on May 1, 1903, 83.4 the year previous, and 89.5, the mean of the May averages of the last ten years.

The average condition of meadow mowing lands was 85, against 92.8 on May 1, 1903, 86.6 the year previous, and 90.7, the mean of the May averages of the last ten years.

The average condition of spring pastures was 80.5, against 92 on May 1, 1903, 84.9 the previous year, and 90.3, the mean of the May averages of the last ten years.

Of the total acreage of spring plowing contemplated, 57.3 per cent was reported as actually done May 1, as compared with 57.9 per cent on May 1, 1903, and a ten-year average of 70.3.

The available records of the department show for no preceding year such uniformity of unfavorable conditions as is reported on May 1 of this year.

In Massachusetts the average condition of meadow mowing lands was given as 87, the average condition of spring pastures as 86, and the proportion of spring plowing actually done as 19.

WEATHER SUMMARY, JAN. 1 TO MAY 1, 1904.

[FURNISHED BY WEATHER BUREAU, BOSTON.]

The weather of January will long be remembered for its unusual severity, the cold waves being of marked intensity, the storms heavy and frequent, with gales of great force along the coast, and snowfall of unusual depth throughout all sections. The monthly mean temperature was decidedly below the normal in parts of the State, the departures ranging from 3° on the islands along the southern coast to 8° in interior portions of the State. The minimum temperatures ranged from 2° above zero at Martha's Vineyard to 25° to 30° below in interior localities. The snowfall of the month was far in excess of the amounts usually experienced in January, and in some instances the amounts were equal to the normal

for an entire winter. The total depth for the month ranged from 4 inches on the immediate coast to about 50 inches in some of the interior sections. January as a whole may be considered one of the most severe months that has occurred during the last century.

February was a fitting climax to a winter that, so far as temperatures are concerned, is unprecedented in the official records. The monthly means were again below the normal at all stations, the departures ranging from 3° on the coast to 8° in the interior and west portions. The snowfall was in excess of the average, although the monthly amounts were much below those of the preceding month. The month was also characterized by severe and persistent storms along the coast, during which the wind blew with great violence. Shipping was greatly inconvenienced and delayed, although few casualties resulted. This month will also go on record as one of great severity.

The meteorological conditions of March presented features at little variance from those usually experienced at this time of the year. While the temperature at the major portion of the points of observation was below the average for March, the deficiencies were not so marked as in the preceding months. The same may be said of the precipitation, which was chiefly in the form of snow. The storms of the month were less severe and fewer in number than usual for March. The month closed with moderate weather, during which the snow disappeared, except in protected places, giving conditions favorable to the beginning of farming operations.

April as a whole was very unpleasant, the weather being unusually cold and wet. With slight exceptions the month was the coldest of its name within official records. The temperatures, entire month, were below normal at all stations, with the monthly departures ranging from 1° to 4° . The precipitation of the month was remarkably heavy, although well distributed through the period and over the territory. The monthly amounts were among the largest of record for April. At the close of April it was generally estimated that the season was from ten to fifteen days behind the average.

TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM UNITED STATES CLIMATE AND CROP BULLETINS.]

Week ending May 9. — The week was colder than usual on the north Pacific coast, in the central and southern Rocky Mountain districts and west Gulf States, and along the middle and south Atlantic coasts. In central California, the central valleys, Lake region, New England and the northern portion of the Middle Atlantic States the week was warmer than usual, the most marked excess occurring in the Lake region and southern New England. In the lower Lake region and Ohio valley and over much the greater part of the Atlantic coast and east Gulf districts the rainfall was below the average, a considerable part of the Middle Atlantic States, New England and the east Gulf States receiving no measurable amount. Over the Rocky Mountain slope and from the west Gulf coast northward to the upper Lake region and Red River of the North valley the rainfall was unusually heavy.

Week ending May 16. — The week was warmer than usual in the Pacific coast States, middle and southern Plateau districts, New England, the northern portion of the Middle Atlantic States and in southern Florida. Throughout the central valleys and Gulf States and over the greater part of the Lake region the week was colder than usual, the deficiency ranging from 3° to 9° per day. The Middle Atlantic States, the greater part of New England, the eastern portion of the lower Lake region, and an area extending from northern Texas over Oklahoma, and the eastern portions of Kansas, Nebraska and South Dakota, received more than the average rainfall. Generally throughout the southern States and in the Ohio and upper Mississippi valleys and the central portion of the Lake region the rainfall was less than usual. The rainfall of the Pacific coast was also below the average.

Week ending May 23. — In the lower Lake region, Ohio and lower Mississippi valleys, east Gulf States, and on the Atlantic coast south of New England the week averaged cooler than usual. The week was also slightly cooler than usual in southern Texas and on the immediate coast of Washing-

ton. In all other districts the temperature was above the normal, the excess being very slight in New England, over the south-eastern Rocky Mountain slope and in the southern Plateau and Pacific coast regions. Over very much the greater part of the United States the rainfall was below the average, no appreciable amount being reported from large areas in the southern States and central valleys, but over a considerable part of the upper Lake region and portions of the New England and South Atlantic States the rainfall was excessive.

SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

Week ending May 9. — New England. Boston: Week exceptionally favorable for growth of all crops, especially grass and fall grain; peas, beets, onions and a few potatoes up in south; tobacco plants improving, condition fair; light frost 3d, slight damage.

Week ending May 16. — New England. Boston: Too wet in central western Maine, otherwise weather seasonable; crops made good growth, much planting and plowing done; grass and grain in excellent condition; all fruit trees blooming profusely except peaches, latter not promising; cranberries wintered well; tobacco outlook good, some setting.

Week ending May 23. — New England. Boston: Weather generally unfavorable except for fall grain and grass, growth of latter very rapid; fruit of all kinds blooming full; apples exceptionally promising; all berries promise well; rain north retarded potato planting; tobacco setting delayed, many beds backward.

THE WEATHER OF MAY, 1904.

The opening week of the month was marked by an unusual prevalence of sunshine and almost an entire absence of rainfall. The temperature during the period was generally above the seasonal average, the days being quite warm and the nights somewhat cooler than usual for the season. The first rain of consequence in amount and territory covered fell on the 9th–10th. This was followed by several days of unsettled but generally fair weather, and the next storm

of importance was on the 19th, during which the rainfall, largely from showers, was quite copious. The temperature during the second decade, when taken from day to day, was uneven, but when considered as a whole it varied but little from the normal. The weather for the remainder of the month was characteristic of the season; clear to partly cloudy skies, interspersed with well-distributed showers, during which the rainfall was generally in small amounts. The temperature of the last decade was continuously above the average of the time of year, although there were no unusual excesses. Throughout the month the days were warm and the nights moderately cool, resulting in a monthly temperature considerably above the average, and a daily excess of from 2° to 4° . Thunderstorms were fully as frequent as the average, and in some localities there was damage from lightning and high winds. Hail accompanied the storms in some sections, but was of little importance, as crops were not sufficiently advanced to be materially injured thereby. May as a whole was a very pleasant month, the weather being well suited to outdoor recreation and to farm operations.

In the circular to correspondents, returnable May 24, the following questions were asked:—

1. How does the present season compare, agriculturally speaking, with a normal season?

2. What is the promise for pastures and mowings, and did fall seeding winter well?

3. How did the bloom of apples, pears, peaches, plums and small fruits compare with the bloom of former years, and has it suffered from frosts?

4. What insects appear to be doing the most damage in your locality?

5. To what extent is spraying practised against insects attacking fruit, and is it on the increase in your locality?

6. Is farm help scarce, or plenty; and what proportion can be called good help?

7. What are the average wages paid farm help in your vicinity, with board? Without board?

8. Will there be any marked change in the acreage of the

usual farm crops, and do you note any new enterprises in the line of agriculture?

Returns were received from 127 correspondents, and from them the following summary has been compiled : —

THE SEASON.

April was a cold month, and May opened from a week to ten days late. The wet weather of the month operated to delay farm work still further, and it is still somewhat in arrears. Vegetation, however, advanced very rapidly, and at time of making returns was well up to the normal. The warm weather and frequent showers of the last ten days of the month were also very favorable to vegetation, to the germination of seeds and to early planted crops, so that the season was probably as far advanced as usual at the close of the month. The fruit bloom occurred very close to the average date in all parts of the State.

PASTURES AND MOWINGS.

Pastures and mowings wintered well, as a rule, although ice lay on the ground in some low situations during the late winter and early spring, badly winter-killing grass in those places. The first part of the month was very favorable to grass, owing to frequent rains, and gave pastures and mowings a splendid start. The warm weather and showers of the latter part of the month were also beneficial, and at time of going to press the prospect for the grass crop was never better at the same time of year. Fall seeding wintered well, with the exception of occasional winter-killing from ice, and, like all grass, got a good start and made good progress during May.

FRUIT BLOOM.

The apple bloom was generally reported to have been unusually heavy, though there are a few complaints of light bloom on Baldwins, but probably sufficient for a good crop with good future development. Peach trees were badly injured by the cold winter in many localities, and many trees were entirely destroyed; the bloom was therefore very light for the State as a whole, although a few localities report a

fair to good bloom. Cherries and plums made a full bloom, but there are some complaints that the pear bloom was light. Small fruits winter-killed in many sections, but where they came through the winter well made a full bloom. Wild berries also blossomed well. Up to time of going to press there was absolutely no damage from spring frosts, and no prospect of future injury from that source.

INSECTS.

At the time of making returns but few insects had appeared, and they were doing very little damage. Tent caterpillars were less prevalent than usual, but still the insect most commonly reported. Very few correspondents reported the potato bug as having appeared at time of making returns. Other insects mentioned are canker worms, currant worms, cut worms, the horn fly, the elm-leaf beetle and the San José scale.

SPRAYING.

Those farmers who make fruit raising a specialty generally spray their trees, and find the practice profitable. Other farmers are probably deterred from spraying in a large measure by the first cost of the necessary outfit, though an increasing number adopt the practice from year to year. This being the bearing year for apples, there should be more spraying by farmers than for a number of years past.

FARM HELP AND WAGES.

Farm help appears to be fairly plenty, and most of it is fairly good, although the supply of first-class help is, as always, limited. The ideal man, like the ideal master, is not often found. Twenty dollars per month with board is apparently a fair average of the wages paid, and \$35 per month without board, though little help is employed in this way. For work by the day, \$1.50 per day seems to be the price commonly paid, and even higher in some sections.

ACREAGE OF FARM CROPS.

A slight increase in the acreage of potatoes is indicated by the returns; otherwise, the acreage of the various farm crops raised will not vary much from former years.

NOTES OF CORRESPONDENTS.

(Returned to us May 24.)

BERKSHIRE COUNTY.

New Marlborough (E. W. RHOADES). — The season compares favorably with the normal. Grass is looking well except where winter-killed by ice. Fruit trees, with the exception of pears, are blossoming full. Not much spraying is done in this locality. There seems to be enough farm help, but three-fourths of it or more is poor help. Wages average \$25 per month with board, and \$25 to \$30 per month without board. There will probably be an increased acreage of potatoes, though many are compelled to use poor seed.

Alford (L. T. OSBORNE). — On the whole, the season is more favorable than the average. Pastures and mowings were never more promising, and fall seeding wintered well. Full bloom of apples; peach trees nearly killed; pears not looking well. Tent caterpillars are the only insect as yet, and they are not as plentiful as usual. Spraying is not largely practised, but is on the increase. Farm help is very scarce, and there is but little good help to be had. Wages average \$20 per month with board, and from \$25 to \$35 per month without board. Dairying is our main line, and there are no changes in our usual system.

Tyringham (E. H. SLATER). — The present season compares favorably with a normal season. Pastures and mowings are looking well; fall seeding badly winter-killed. The bloom of apples, pears and peaches compares favorably with former years, and has not suffered from frosts. Insects are not doing much damage. Farm help is scarce, about one-half of it being good help. Wages average \$20 per month with board and \$1.50 per day without board. The acreage of potatoes will be somewhat increased this year.

Washington (E. H. EAMES). — The season is about the same as in former years. Pastures and mowings promise well, and fall seeding wintered well. The fruit bloom is full, and has not suffered from frosts. No insects have appeared as yet. Spraying is

not practised in this locality. Farm help is scarce, and the available supply not good. Wages average from \$15 to \$18 per month with board and about \$1.50 per day without board. The acreage of farm crops will not be materially changed.

Richmond (T. B. SALMON).—The season is well up to the normal in promise. Pastures look well and mowings are in good condition; no fall seeding done here. There was a good bloom of all kinds of fruit, and it has not suffered from frosts. Tent caterpillars are doing some damage. Spraying is little practised, and is not increasing. Farm help is scarce, and two-thirds of it is good help. Wages average from \$16 to \$20 per month with board and \$1.50 for a day of nine hours without board. There will be no marked changes in the acreage of farm crops.

Dalton (WESLEY B. BARTON).—The present season is fully up to the normal. Pastures and mowings are in excellent condition, and all fall seeding looks finely. Apples and pears bloomed well; plums and peaches winter-killed badly. One-fourth of our farmers spray their fruit trees, and the practice is increasing. Farm help is more plenty than of late years, and half of it is good help. Wages average \$22 per month with board and \$1.50 per day without board. There will be no material change in the acreage of farm crops.

Savoy (W. W. BURNETT).—We anticipate fully a normal season. Pastures and mowings are in good average condition, and fall seeding wintered well. Fruit trees are not yet in bloom, but the outlook is good for a full bloom, though late, with no damage from frosts. Spraying is little practised, and is not on the increase. Farm help is scarce, so that any help is called good. Wages average \$20 per month with board and \$1.50 per day without board. Planting has been delayed by wet weather, so that it is impossible to determine the acreage of the various farm crops.

Williamstown (S. A. HICKOX).—The season is a normal one. Pastures and mowings are in good condition, and fall seeding wintered well. The fruit bloom is not as full as some years, but is enough for practical purposes. Tent caterpillars are doing some damage. Spraying is not extensively practised. Farm help is plenty, but not over one-fourth of it is good help. Wages average \$20 per month with board and from \$30 to \$35 per month without board. There will be no marked changes in the acreage of farm crops.

FRANKLIN COUNTY.

Rowe (F. W. WOFFENDEN).—The season compares favorably with the normal. Pastures and mowings promise well, and fall seeding wintered well. There is about an average fruit bloom,

with no damage from frosts. Canker worms and potato bugs are doing some damage. There is but little spraying done, but the practise is rather increasing. Farm help is scarce, and one-half of it is good help. Wages average \$22 per month with board and \$35 per month without board. There will be about the usual acreage of the various farm crops.

Hawley (C. C. FULLER). — The season compares well with the normal. Pastures and mowings are in fine condition, and fall seeding looks well. The fruit bloom is late, but is coming out well; no frosts as yet. Insects are not doing any damage as yet. Spraying is very little practised. Farm help is very scarce, but nearly all is good help. Wages average from \$20 to \$25 per month with board and \$1.50 per day without board.

Colrain (A. A. SMITH). — The season is a full average one, agriculturally speaking. The grass crop gives promise of a bounteous harvest. The fruit bloom is fully up to the normal. No insects have appeared as yet. Spraying is practised to a large extent, and is on the increase. Farm help is scarce, and not over half of it is good help. Wages average \$25 per month with board and \$1.50 per day without board. Possibly there will be more forage crops raised for soiling purposes than in former years.

Shelburne (GEO. E. TAYLOR). — Cold weather kept vegetation back until May, when it came forward with surprising rapidity, and all things are now up to the normal condition. Pastures good; upland mowings good, low lands winter-killed. All fruit shows a very full bloom. No insects are doing damage of any account. Spraying is but little practised. Farm help is not very plenty, and not much of it is good help. Wages average \$20 per month with board and \$1.25 to \$1.50 per day without board. There are no marked changes in the acreage of farm crops.

Sunderland (J. M. J. LEGATE). — Planting is two weeks later than some years. Mowings are looking finely, and fall seeding never looked better, except on low lands where ice lay. The fruit bloom of all kinds is away above the average, and we have had no frosts as yet. No insects except a few tent caterpillars. Farm help is plenty, and most of it is good. Wages average from \$18 to \$22 per month with board and \$1.50 per day without board. There may be a slight increase in the acreage of tobacco.

Montague (C. S. RAYMOND). — The season is perhaps a little later than the normal. Pastures and mowings promise well, but grass winter-killed in some low places. All kinds of fruit show a fine bloom. Very little damage from insects. Spraying is but little practised. Farm help is very scarce, and only a very small

proportion of it can be called good help. Wages average from \$20 to \$25 per month with board and from \$35 to \$40 per month without board. No changes in the acreage of farm crops.

Erving (C. F. CLARK). — The season compares favorably with the normal. Pastures and mowings promise well, and fall seeding wintered well. There is about an average fruit bloom, and no damage from frosts. Very little damage is being done by insects. Spraying is but little practised, but is increasing somewhat. Farm help is not very plenty; one-half of it is good. Wages average \$17 per month with board and \$1.25 per day without board. There will be no marked changes in the acreage of farm crops.

North Orange (A. C. WHITE). — Wet and cool weather have pushed the grass crop, but delayed planting. Pastures and mowing look finely, and fall seeding wintered well. Fruit trees of all kinds are white with blossoms. A few tent caterpillars are the only insects that have appeared. Spraying is but little practised, but is rather increasing. Farm help is scarce, and is mostly local help. Wages average 15 cents per hour with board and 20 cents per hour without board. There will be about the usual acreage of farm crops, though continued cool weather would result in a decreased acreage of corn.

HAMPSHIRE COUNTY.

Prescott (W. F. WENDERMUTH). — The season is two or three weeks late. Pastures and mowings promise well; fall seeding winter-killed somewhat. There is a heavy bloom of all fruits except peaches, with no damage as yet from frosts. No insect pests have appeared as yet. Spraying is not practised. Farm help is scarce, and perhaps half of it is good help. Wages average \$22 per month with board, and \$1.25 to \$1.50 per day without board. There will be the usual acreage of farm crops.

Amherst (WM. P. BROOKS). — The season is still somewhat late, and work is generally behind because of frequent rains. Pastures and mowings promise much better than usual; fall seeding wintered well, except in spots where ice formed on the ground. Apples, except Baldwins, blooming full; peaches practically no bloom; plums and pears full; currants very full; blackberries and raspberries badly winter-killed and not yet in bloom. No insects are especially noticeable. Spraying is practised only by those who make fruit a specialty, and is increasing but slowly. Wages average from \$20 to \$25 per month with board and from \$35 to \$45 per month without board. There are few changes in

the acreage of crops. Keeping hens in open movable coops for summer egg-production is increasingly practised, with good results.

Hadley (L. W. WEST). — The season to date looks very favorable. Pastures and mowings promise well; very little fall seeding winter-killed. Quince bushes winter-killed; no bloom on peaches; other fruits show average bloom; no frosts. Tent caterpillars are doing some damage. Spraying is not extensively practised, and is not on the increase. Farm help is neither scarce nor plenty, and one-half of it is good help. Wages average \$20 per month with board and \$1.50 per day without board. There will be a larger acreage of onions than usual.

South Hadley (H. W. GAYLORD). — The season is about a week late on everything except grass and fall-sown grain. Fall seeding wintered well; mowings that were fertilized look finely; pastures not up to the average. All fruits show average bloom except peaches; 50 per cent of peach trees dead, and half the remainder badly injured. Not much damage from insects as yet. Very little spraying is done. Farm help is plenty, such as it is. Wages average \$18 to \$20 per month with board and \$1.50 per day without board. There is a disposition to grow more corn than usual, but much of that already planted has failed to come up.

Easthampton (W. E. CLAPP). — The season is a favorable one. Pastures are in good condition, and fall seeding wintered well. With the exception of peaches, there is a good fruit bloom and no damage from frosts. The currant worm is doing some damage. Spraying is not much practised. Farm help asks from \$20 to \$25 per month and board and \$1.50 per day without board. There are no marked changes in the acreage of farm crops.

Williamsburg (F. C. RICHARDS). — The season is backward. Pastures and mowings promise well, and fall seeding wintered well. All varieties of apples blossomed full except Baldwins, which are backward and not as full as some years, but enough for a heavy crop. Peaches made a very full bloom; other fruits promise well. No insects are very injurious as yet. Spraying is not much practised, and is not increasing. Farm help is very scarce, and practically none can be called good help. Wages average \$18 to \$20 per month with board and from \$30 to \$35 per month without board. There will be an increased acreage of potatoes.

Huntington (H. W. STICKNEY). — Most of our land is so wet that little planting has been done. Pastures and mowings never looked better; fall seeding winter-killed on low land. There is a very full bloom of all kinds of fruits, and no frosts as yet. No insects have appeared. There is but little spraying done here.

Farm help is very scarce, and it is hard to find a good man. Wages average \$1.25 per day with board.

Plainfield (S. W. CLARK). — The land is so wet that very little plowing has been done. Grass is looking finely, and fall seeding wintered well. No peaches here, other fruits about an average bloom, with no damage from frosts. No insects have appeared as yet. Farm help is rather scarce, mainly Polish, and fairly good. Wages average \$20 per month with board for English-speaking help, green men \$15 per month and board. I hear that more potatoes will be planted than usual, and very little corn, as good seed is scarce.

HAMPDEN COUNTY.

Blandford (E. W. BOISE). — The season is thus far cold, wet and backward. Pastures and mowings look well, but many are badly winter-killed; fall seeding wintered well. All fruits and berries show an extra full bloom. Tent caterpillars are appearing, and promise to be plenty. Very little spraying is done here. Farm help is scarce, and not over half of it good help. Wages average from \$20 to \$25 per month with board and from \$35 to \$40 per month without board. There will be an increased acreage of potatoes.

Russell (E. D. PARKS). — The season is favorable, but a little late. Pastures and mowings are above the average in condition at this time, and fall seeding wintered well. The fruit bloom was up to the average, with no frosts. Tent caterpillars and currant worms are doing some damage. Spraying is but little practised. Farm help is scarce, and not over one-fourth of it is good help. Wages average \$1 per day with board and \$1.50 per day without board. There are no marked changes in the acreage of crops.

West Springfield (T. A. ROGERS). — April was very cold, and the season is two or three weeks late. Pastures look well, but mowings were winter-killed by ice; fall seeding wintered fairly well. There is a nearly full bloom of apples, pears and plums; no peaches; strawberries winter-killed somewhat, but show a fair bloom. Tent caterpillars and currant worms are doing some damage. Very little spraying is done, and it is not on the increase. Farm help is not very plenty, and perhaps half of it can be called good. Wages average from \$20 to \$25 per month with board and \$1 to \$1.75 per day without board.

Wilbraham (H. M. BLISS). — The season is a fair average one. Pastures and mowings look well, and fall seeding wintered well. Apples and plums made a good bloom, but peaches are a failure. Spraying is but little practised. Farm help is scarce, and 20 per

cent of it is good help. Wages average from \$15 to \$20 per month with board and \$1.50 per day without board. Planting is ten days late.

Monson (F. D. ROGERS). — The season is later than the normal. The promise for pastures and mowings is better than usual. There was a full bloom of apples, pears and plums; peaches, 5 per cent. Tent caterpillars are doing some damage. Farm help is scarce. Wages average \$20 per month with board and \$1.50 per day without board. More corn and fodder crops will be grown than usual.

Palmer (O. P. ALLEN). — The season has been cold and backward, but is now nearly up to the normal. Pastures and mowings promise well. The bloom of all fruits has been exceptionally fine, with the exception of peaches. Few insects have appeared as yet. Spraying is not practised to any great extent. Farm help is rather scarce, and about half of it is good. Wages average about \$18 per month with board and \$1.50 per day without board. There are no marked changes in the acreage of farm crops.

Holland (FRANCIS WIGHT). — The season is rather backward. Pastures and mowings are looking well; fall seeding winter-killed in spots. There is more than an average bloom of apples, pears, peaches, plums and small fruits; no frosts as yet. Insects have not appeared as yet. Spraying is not much practised, and is not increasing materially. Farm help is very scarce. Wages average \$1 per day with board and \$1.50 per day without board. There are no marked changes in the acreage of farm crops.

WORCESTER COUNTY.

Warren (W. E. PATRICK). — The season compares favorably with a normal one. Pastures and mowings promise well where not winter-killed, but much was killed on low land; fall seeding wintered well. The fruit bloom is very full, and not injured by frosts. No damage from insects worth mentioning. Very little spraying is done, but I think the practice is increasing. Farm help is more plenty than for several years, and possibly one-third of it might be called good help. Wages average \$20 per month with board and \$1.50 per day without board. There will be no change in the usual acreage of farm crops.

Spencer (H. H. KINGSBURY). — The season is backward at present. Pastures and mowings now promise liberal yields this season. Fruits of all kinds show a very full bloom. Weather conditions have thus far been unfavorable to insect life. There has been very little spraying done in this vicinity. Help is obtained at the agencies, and is not plenty. Wages average from

\$15 to \$20 per month with board and from \$1.50 to \$1.75 per day without board.

Oakham (JESSE ALLEN). — The season is better than an average one at present. Pastures and mowings are looking well, and fall seeding wintered well. There is an abundant bloom of all fruits, with no damage from frost. Tent caterpillars are doing some damage. Very little spraying is done in this region. Farm help is scarce, and perhaps half of it is good help. Wages average about \$20 per month with board and \$30 per month without board. There will be no marked changes in the acreage of farm crops.

Petersham (D. F. BIGELOW). — The prospect for the season is much better than last year at this time. Pastures and mowings were never better, and fall seeding wintered well. Apples, pears, peaches, plums and small fruits here blossomed well; no damage from frost. Tent caterpillars are doing some damage. Not much spraying is done here. Farm help is scarce. Wages average \$18 to \$22 per month with board and \$35 to \$50 per month without board. There will be an increased acreage of potatoes.

Royalston (C. A. STIMSON). — The season is better than for the last two years. Pastures and mowings promise excellently, and fall seeding wintered well. There is a full bloom of all kinds of fruit, and no damage from frost. No insects have appeared as yet. Spraying is not practised here against insects attacking fruit. Farm help is scarce, and one-eighth of it is good. Wages average \$25 per month with board and \$1.50 per day without board. There will be no marked changes in the acreage of the usual farm crops.

Templeton (LUCIEN GOVE). — Spring opened late, and with stormy weather farm work has been delayed to an unusual degree; climatic conditions better than usual. Mowings look finely, but pastures are rather backward; fall seeding wintered well. Apples, pears, plums, cherries and strawberries gave a full bloom. There is no damage from insects as yet. Very little spraying is done, and the practice is not increasing. Farm help is rather more easy to get than for several years, and about 20 per cent of it is good help. Wages average from \$12 to \$25 per month with board and \$1.50 per day without board.

Fitchburg (Dr. JABEZ FISHER). — The season does not vary essentially from the normal. Pastures and mowings promise first-class results, and fall seeding wintered well. The bloom is heavier than the average for nearly all fruits, and there is as yet no injury from frost. The full bloom of the Baldwin apple occurred on the 21st, which is the average date of bloom for forty-eight years. Cut worms and tent caterpillars are doing some damage. Spraying is

not very much practised, but is increasing somewhat. Good help is scarce. Wages average \$20 per month with board and \$1.50 per day without board.

Princeton (A. O. TYLER).—The season is backward. The prospect for pastures and mowings is good, and fall seeding wintered well. Apples and pears made a good bloom; peaches poor; small fruits good. No insects have appeared as yet. Very little spraying is done, and I do not think it is increasing. Farm help is scarce, and only a small proportion of it good help. Wages average \$18 to \$25 per month with board and \$1.50 to \$2 per day without board. There will be an increased acreage of potatoes this year.

Bolton (H. F. HAYNES).—Pastures and mowings look well. Full bloom of apples and plums; no peaches; no frosts to injure. No insects have appeared as yet. Some few spray, but there is no appreciable increase. Farm help is scarce. Wages average \$20 to \$25 per month with board and \$1.50 per day without board. Planting is so late that it is impossible to estimate as to the acreage of farm crops.

Worcester (S. A. BURGESS).—The present season is a good average one. The promise for pastures and mowings is very good. There is quite a full bloom for all fruits, and no damage from frosts. Tent caterpillars are doing some damage. Spraying seems to be on the increase. Some kinds of help are plenty, and about one-fourth of it is good. Wages average \$25 per month with board and \$1.50 per day without board. There are no marked changes in the acreage of farm crops.

Hopedale (DELANO PATRICK).—The season is about average, but the cold, wet weather has delayed planting. Pastures and mowings are promising, and fall seeding looks well. There is a bountiful supply of fruit blossoms, and no frosts to injure them. No insects are doing much damage. Spraying is but little practised, and I think is not on the increase. Farm help is very scarce, and but little good help. Wages average \$1.75 per day without board. There are no marked changes in the acreage of farm crops.

MIDDLESEX COUNTY.

Hopkinton (W. V. THOMPSON).—The season is a favorable one. Pastures and mowings promise well. There is a full bloom for all kinds of fruits except peaches, and no damage from frost. No insects have shown up as yet. Spraying is not practised in this locality. There is about the usual acreage of all farm crops.

Sherborn (N. B. DOUGLAS).—The season is a trifle later than

the average. Pastures and mowings never looked better, and fall seeding wintered well. Apples, pears and plums made a full bloom; no peach bloom; no injury from frosts thus far. No insects have done damage as yet. Spraying does not seem to be as general as ten years ago. Farm help is not plenty, but three-fourths of it is good help. Wages average \$20 to \$25 per month with board and \$1.50 per day without board.

Maynard (L. H. MAYNARD). — The season is about two weeks late, but will compare favorably with the normal in other respects. Pastures and mowings look uncommonly well, and fall seeding wintered well. There have been no frosts to do any damage to fruit; apple bloom about 75 per cent of that of two years ago; pears, plums and nearly all small fruits bloomed full; peaches a failure. Potato bugs have made their appearance. Spraying is practised to some extent, but it is not on the increase. Farm help is scarce and a very small proportion of it can be called good help. Wages average \$20 to \$30 per month with board and \$1.50 to \$2 per day without board.

Townsend (G. A. WILDER). — The season is about an average one. Pastures and mowings promise better than usual, and fall seeding wintered well. The fruit bloom is very good, but was injured by frost on low land. Some of our best fruit growers are spraying, and the practice is increasing. Farm help is scarce, and not over 10 per cent of it is good help. Wages average from \$15 to \$20 per month with board and \$1.50 per day without board. There will be no marked changes in the acreage of farm crops.

Dunstable (A. J. GILSON). — The season is fully up to a normal one. Pastures and mowings are in fine condition, and fall seeding wintered well. There is a full bloom of all kinds of fruit except peaches, and it has not suffered from frost. No injurious insects have appeared. Spraying is not practised to any extent. Farm help is very scarce, and only a small proportion of it can be classed as good help. Wages average from \$20 to \$25 per month with board and from \$35 to \$40 per month without board.

Carlisle (E. J. CARR). — The season is above the average, and all conditions are favorable. Pastures and mowings are looking finely, and fall seeding wintered well. All fruit trees have blossomed well, and there have been no injuries from frost. There are very few insects at present, and they are not doing much damage. Very few farmers spray, and the increase is slow. There seems to be plenty of help of a cheap grade. Wages average \$23 per month with board and \$1.75 per day without board. More corn is planted every year for the silo.

Lincoln (C. S. WHEELER). — The season is about two weeks late.

Pastures and mowings promise well, and fall seeding wintered well. There is a full bloom of fall apples, Baldwins not over half a full bloom; peaches light. The San José scale is doing some damage to orchards; other insects not in evidence thus far this season. Perhaps a tenth of our farmers spray, and the practice is increasing. Farm help is scarce, and perhaps half of it is good help. Wages average \$22 per month with board and from \$35 to \$40 per month without board. There are no marked changes in the acreage of farm crops.

Stoneham (J. E. WILEY).—The season is backward. The promise for pastures and mowings is good, and fall seeding wintered well. Apples made a good bloom and pears a fair one, with no damage as yet from frosts. Currant worms are doing some damage. One-half of our farmers spray, and the practice is increasing. Farm help is scarce, and half of it is good help. Wages average \$23 per month with board and \$1.75 per day without board. There will be no especial changes in the acreage of farm crops.

Weston (H. L. BROWN).—Wet weather has delayed planting, but vegetation is up to the normal. Pastures and mowings are in good condition, and fall seeding wintered well. Apples, pears and plums show a good bloom, also some peach orchards, but trees winter-killed in others. A few tent caterpillars have appeared. But little spraying is done, and the practice is not increasing. Good help is scarce, not one in ten being good help. Wages average \$20 per month with board and \$1.75 per day without board.

ESSEX COUNTY.

Salisbury (WESLEY PETTENGILL).—The season has been cold, wet and backward, and planting has been much delayed. Pastures and mowings are looking well, and fall seeding wintered well. There was a large bloom on apple and pear trees; a fair bloom of peaches, enough, if they set well; plums and small fruits a large bloom. There are a few tent caterpillars. There is not much spraying done except for canker worms. Farm help is scarce, and about 25 per cent of it is good help. Wages average from \$20 to \$25 per month with board and \$1.50 per day without board. There will be a smaller acreage of farm crops than usual.

Haverhill (EBEN WEBSTER).—The season has been late, wet and cold for planting. Fall seeding wintered fairly well, and pastures and mowings are in good condition. There are few peach blooms, other fruits about normal. Canker worms and tent caterpillars are doing some damage. Spraying is on the increase.

Farm help is plenty, and but a small proportion of it is good help. Wages average from \$18 to \$20 per month with board and \$30 per month without board. There will be about the usual acreage of farm crops.

Newbury (GEO. W. ADAMS). — The season is very late, wet and cold. The prospect for pastures and mowings is good, and fall seeding wintered fairly well. There is an average fruit bloom, with no damage from frosts. Tent caterpillars are the only insects present as yet. Perhaps one-tenth of our farmers spray, with a slight increase from year to year. Farm help is very scarce and poor. Wages average \$18 to \$30 per month with board and from \$1.50 to \$2 per day without board. There will be no changes in the acreage of the usual farm crops.

Topsfield (B. P. PIKE). — The season is now very promising. Mowings and pastures were never in better condition. Apples made a very full bloom, other fruits fair; peaches winter-killed. No insects have appeared as yet. Spraying is not much practised, and is not increasing. Farm help is scarce, and very little of it is first class. Wages average from \$18 to \$25 per month with board and from \$1.50 to \$1.80 per day without board. The acreage of farm crops is not as large as in former years.

Danvers (C. H. PRESTON). — The season is late. Pastures and mowings promise well, and fall seeding wintered well. Apples made a fair bloom, pears fair, peaches few, plums good; small fruits winter-killed. Tent caterpillars are doing some damage. Farm help is scarce. Wages average from \$35 to \$40 per month without board. There will be no marked changes in the acreage of the usual farm crops.

NORFOLK COUNTY.

Canton (E. V. KINSLEY). — Spring work is backward, but vegetation is advanced to the normal. Pastures and mowings are above average in condition; fall seeding winter-killed in spots. Apples and plums made a very full bloom; peaches and pears very light; no damage from frost as yet. No damage by insects at this time. There is very little spraying done in this section, and no increase. Farm help is scarce, and not 10 per cent of it is good help. Wages average about \$20 per month with board and \$1.50 per day of nine hours without board. There are no changes in the acreage of farm crops to be noted at this time. Prices of milk about the same as last summer, and supply at this writing ample.

Walpole (E. L. SHEPARD). — The season is late, cold and wet,

but looks favorable for good crops. Pastures are looking well, and mowings extra well; fall seeding wintered about as usual. Apples, except Baldwins, show a full bloom; pears small; peaches and plums poor; small fruits average; no frosts as yet. Tent caterpillars are doing some damage. Very little spraying is done in this locality, and it is not on the increase. Farm help is scarce, and very little of it is good help. Wages average \$20 per month with board and \$2 per day without board. There are no marked changes in the acreage of farm crops.

Millis (E. F. RICHARDSON). — The season is late. Pastures and mowings promise well, and fall seeding wintered finely. There is a good bloom of apples and pears; peaches much below the average, and many trees winter-killed. No insects are doing damage at present. Spraying is practised but little. Farm help is scarce, and about half of it good help. Wages average \$20 to \$25 per day with board and \$1.50 per day or \$10 per week without board. There will be no marked changes in the acreage of the usual farm crops.

BRISTOL COUNTY.

Attleborough (ISAAC ALGER). — The season is well up to the normal. Pastures and mowings are above the average in condition, and fall seeding wintered well. Apples and pears made an average bloom, except Baldwin apples; no peach bloom; plums and small fruits fair. No insects are doing damage. Spraying is but little practised. Farm help is fairly plenty. Wages average \$20 per month with board and \$1.50 per day without board. There will be no marked changes in the acreage of farm crops.

Norton (WM. A. LANE). — The season is about a normal one. Pastures are looking well, and fall seeding is in good, fair condition. Apples had a very heavy bloom, pears fair; peach trees are all dead in this locality. Tent caterpillars are the only insects that have appeared. Spraying is increasing in this locality. Farm help is not plenty, and what there is is not very good. Wages average \$24 per month with board and \$1.50 per day without board. There will be an increase in the acreage of potatoes.

Westport (A. S. SHERMAN). — No crop is up to the average except grass, and planting is delayed. Pastures and mowings promise well, and fall seeding is in good condition. Apple trees have bloomed full, pears medium; peaches will be scarce, being badly winter-killed. A few tent caterpillars are the only insects as yet. Very little spraying is done, and the practice is not increasing. Farm help is very scarce, and not over 25 per cent of it can be called good help. Wages average from \$22 to \$26 per month with

board and \$1.50 per day without board. Potatoes are planted more extensively this year than usual.

Dartmouth (L. T. DAVIS). — The season is nearly or quite two weeks late. Pastures and mowings are coming along quite well, and fall seeding looks very well. Apples made a fair bloom, pears medium, plums and small fruits a fair average. Only tent caterpillars are doing any damage as yet. Spraying is very little practised in this section. Farm help is not at all plenty, and the greater part of it is rather poor. Wages average from \$20 to \$25 per month with board and from \$1.25 to \$1.75 per day without board. There are no marked changes in the acreage of farm crops.

PLYMOUTH COUNTY.

Brockton (DAVIS COPELAND). — The season is about an average one. Grass looks well except where ice killed it, and fall seeding also. There was a very full bloom of apples; no peach bloom, trees badly killed by frost. Farm help is plenty, and about 5 per cent of it is good help. Wages average from \$15 to \$25 per month with board and from \$6 to \$10 per week without board. There are no marked changes in the acreage of farm crops.

Marshfield (J. H. BOURNE). — The season is rather unfavorable for everything but grass. Pastures and mowings are in good condition, and fall seeding looks well except in low places, where it winter-killed. The fruit bloom was good, except for peaches and Baldwin apples. Tent caterpillars are the only insect that has appeared. Spraying is little practised, but is slightly on the increase. Farm help is plenty, and about one-third of it is good help. Wages average from \$18 to \$20 per month with board and \$1.50 per day without board. There will be an increased acreage of potatoes.

Hanson (F. S. THOMAS, M.D.). — The season promises much better than last year at this time. Grass is growing very rapidly and luxuriantly. The fruit bloom was never better, and has not suffered from frosts. There is no special trouble with insects. Spraying is but very little practised by our farmers. There is a fair supply of fair help. There are no marked changes in the acreage of the usual farm crops.

Plympton (WINTHROP FILLEBROWN). — The season is very wet, with less frost than for years, and planting is backward. Mowings and pastures are in first-class condition, and fall seeding the best for years. Apples and small fruits promise very well; pears had a small bloom; peaches and plums winter-killed badly. There are fewer insects this year than usual. Spraying is practised more

each year. Farm help is scarce, but what there is is good. Wages average \$20 to \$25 per month with board and from \$1.50 to \$1.75 per day without board. There will be a slight increase in field crops this year.

Carver (J. A. VAUGHAN).—The season compares well with a normal season. Grass in both pastures and mowings is looking well, and growing very fast. There is a full bloom of all fruits except peaches. But few insects have appeared as yet. Spraying is practised to a small extent, but is increasing. Farm help is scarce, and mostly foreign. Wages average \$20 per month with board and \$1.50 per day without board. A large acreage of cranberry bog has been made.

Wareham (A. B. SAVARY).—The season is very backward, but promises well with warm weather. Pastures and mowings promise well, and fall seeding wintered well. The season is so backward that few fruit trees have blossomed; most peach trees winter-killed. There are few insects as yet. Spraying is but little practised, but is increasing slowly. Farm help is very scarce, and about half of it is good help. Wages average from \$15 to \$20 per month with board and \$1.50 per day without board. There are no marked changes in the acreage of farm crops.

BARNSTABLE COUNTY.

Bourne (D. D. NYE).—The season compares favorably with the normal. The promise for pastures and mowings is fine, and fall seeding wintered well. The fruit bloom compared favorably with former years, and has not suffered from frost. Tent caterpillars are doing some damage. Spraying is but little practised, and is not increasing. Farm help is scarce, and half of it is good help. Wages average \$20 per month with board and \$1.50 per day without board. Planting is about two-thirds completed.

Mashpee (W. F. HAMMOND).—The season is below the normal. Pastures and mowings are above the average in condition. All fruit trees and small fruits have bloomed very full, and have not suffered from frost. Tent caterpillars and cut worms are doing some damage. There is very little spraying done here. Wages average \$1 per day with board and \$1.50 per day without board. There is no marked change in the acreage of the usual crops.

Harwich (A. N. DOANE).—The season is very favorable. The prospect is good for a large hay crop. Fruit trees are looking much better than usual, but peach trees suffered from the cold of winter. Tent caterpillars are doing some damage. Not much spraying is done except on cranberry vines. Farm help is scarce,

and but a little of it is first class. Wages average \$20 to \$25 per month with board and \$1.50 per day without board. Cranberry culture is on the increase.

Orleans (F. E. SNOW). — The season more nearly approaches a normal season than has been the case for years. Mowings and pastures are quite promising, and fall seeding wintered well. Most fruits are blooming profusely; peaches somewhat injured by cold weather. No insects except tent caterpillars have appeared as yet. Spraying is not much practised. Farm help is very scarce, and good help still more so. Most help is hired by the hour, at the rate of 17 cents per hour. There are no marked changes in the acreage of farm crops.

Eastham (J. A. CLARK). — The season is rather later than last year, but is catching up rapidly. Pastures and mowings never promised better. There was a very full bloom of all kinds of fruit except peaches. There is no especial damage from insects. Spraying is on the increase. Farm help is scarce, and not of first quality. Wages average from \$15 to \$25 per month with board and 20 cents per hour without board. Perhaps more potatoes than usual will be planted.

Truro (D. E. PAINE). — The season compares favorably with the normal. Pastures and mowings are better than usual, and fall seeding wintered well. There is about an average bloom of all kinds of fruit. No insects in particular are doing any damage. Spraying is not very extensively practised. Help is scarce. Wages average \$20 per month with board and \$30 per month without board. There are no particular changes in the acreage of crops.

NANTUCKET COUNTY.

Nantucket (WALLACE GARDNER). — The season so far has been backward, bringing planting on with a rush, but I look for good crops; we have the moisture, now we want the sun. Pastures and mowings are in good condition, and fall seeding wintered well. The bloom of fruit trees is fully up to the average. No insects have appeared as yet. Spraying is little practised here. Farm help is very scarce, and as a rule very poor. Wages average from \$20 to \$25 per month with board and from \$1.50 to \$1.75 per day without board. There are no marked changes in the acreage of farm crops.

BULLETIN OF MASSACHUSETTS BOARD OF AGRICULTURE.

THE HAY CROP IN MASSACHUSETTS.

By Prof. WM. P. BROOKS, *Professor of Agriculture, Massachusetts Agricultural College.*

In Massachusetts the relative importance of the hay crop is much greater than in the United States as a whole. This crop occupies nearly three-fourths of the improved area of our farms. The last State census reports the total improved area in farms as 902,000 acres. The hay crop occupies 660,000 acres. Large as is this proportion, the tremendously preponderating importance of grass as a crop becomes yet more evident when we consider the area devoted to pasturage, which the last State census reports to have been 1,119,000 acres. There is, of course, little doubt that much of this so-called pasture was occupied to a considerable extent with trees, bushes, ferns and numerous other forms of vegetation other than grass. The total annual value of the farm products of Massachusetts, according to the last State census, was \$52,880,000. The hay crop is reported by the same census to have been worth \$12,491,000. The value of this crop, therefore, amounted to nearly one-fourth of the value of all our agricultural products combined. A large portion of our dairy products is derived from the pastures, and dairy products are reported by the last census to have amounted to \$16,234,000, or nearly 31 per cent of the total value of our agricultural products.

The facts to which attention has been called make it perfectly evident that the grass crop is one deserving careful consideration. It occupies an exceedingly large proportion of our total area, and anything which can be done to increase the product will do much to increase the prosperity of our farmers. Great as is the relative importance of the grass crop at the present time, its relative prominence shows a tendency to increase. This tendency is due in considerable measure to the fact that the production of the grass crop involves relatively little labor; and, in periods of general prosperity especially, it seems to be increasingly difficult for the farmers to secure satisfactory help. Many of them, therefore, are increasing the already large proportion of their farms devoted to grass.

Our numerous cities and villages, while using considerable hay imported from the west and Canada, furnish good markets for the surplus

hay crop in most sections of the State. It does not seem probable, therefore, that the relative importance of the grass crop in Massachusetts' agriculture will decrease in the near future.

Our survey of the facts pertaining to the aggregate production and value, while interesting, does not throw light upon the question as to whether the results now attained by our farmers can be regarded as satisfactory. To determine this point we must know, not the aggregates, but the returns per acre. The last United States census reports the average product of hay per acre in the entire country to be 1.1 tons. The average product in Massachusetts is reported to be exactly the same. Such a product is far below the possibilities, as all good farmers will at once admit. If the average returns from the area devoted to the production of hay in Massachusetts could be increased to the extent of 1 ton per acre, the value of our agricultural products would be raised fully \$8,000,000 per annum. Such an increase must mean greatly increased prosperity among our farmers, provided the increase can be produced at a figure materially below its value. That it can be so produced it will be my effort to show in this article.

Argument is not needed to convince the better farmers of the State that this is possible, for few of them are satisfied with crops of less than from 2 to 3 tons per acre, while many of them doubtless make much of their grass land yield annual crops averaging fully 3 tons per acre. Mr. George M. Clark of Higganum, Conn., has in recent years written a great deal concerning the hay crop and methods of increasing it. It may be doubted whether his methods can be in all respects recommended; but thorough tillage of some sort in preparation for grass and careful fertilization are essentials, and Clark's influence and example have been vastly useful in stimulating improvement. He claims to produce from 5 to 6 tons of hay per acre annually in two crops. Under his system of management the profits have doubtless been large. His investment in labor and fertilizers is heavy; but the tremendous crops obtained prove profitable, in spite of the heavy outlay.

Upon the college farm at Amherst we have not upon the average equalled the crops reported by Clark. We have not, however, as a rule, expended more than a small proportion of as much in labor and in fertilizers as he reports. Our profits are perhaps not inferior to those which he has obtained. The area devoted to hay on the college farm averages about 75 acres, and the average product per acre is often equal to $2\frac{1}{2}$ tons. This result is obtained under the following conditions: About 30 acres out of the 75 are kept permanently in grass. Most of this area has not been plowed for about twenty years. It is managed in part as a park, but is mown twice annually. During a great part of the time it has received an annual dressing with fertilizers at an average cost of perhaps \$5 per acre. The portion of the college farm managed in rotation is usually left in grass three years, and receives no top-dressing of any kind during the time it is in grass, the crop of grass being produced on the residual fertility remaining after the hoed crops, which usually occupy the ground two or three years out of every five or six years. The average crop on the old mowings amounts to about 2 tons

per acre; on the rotation mowings the average must be close to 3 tons.

We possess the most exact records concerning one of the fields of the experiment station. This field has an area of a little more than 9 acres. Most of it was seeded about 1893, and none of it was reseeded until the summer of 1902. Between 1893 and 1902 the average yield for the entire area was 6,619 pounds. In 1902 the average was less, for a part of the land was plowed after the first crop and reseeded in August. This portion of the land, however, gave us in 1903 the heaviest crop we have ever obtained, the average per acre for the entire area for that year amounting to 8,104 pounds. The average yield for the entire period, 1893 to 1903 inclusive, has amounted to almost exactly 6,600 pounds per acre. The average cost of the manure or fertilizer applied to this land annually amounts to about \$12 per acre; the annual cost of securing the crop to a little over \$8; the annual profit on the crop to about \$20 per acre. The figures given, which are verified by the most accurate records, make it sufficiently evident that land of the right character devoted to the production of hay may be made exceedingly profitable. It appears to me evident that the 9 acres under discussion must have an actual value to an intelligent farmer of at least \$350 per acre. The average profit, whatever we may hold concerning the value of the land, amounts to more than 5 per cent annual return on the figure which has been named.

The facts which have been cited make it perfectly evident that the possibilities of the hay crop are vastly beyond the actual results obtained by the average farmer. It may be objected that the land of the college farm at Amherst is especially adapted to grass; that it is better than the average land of the State. Both of these statements are undoubtedly true; but, on the other hand, the value of the hay crop in Amherst is lower than in the average town of the State, and the chances for profit on the crop in most sections must under intelligent management be nearly equal to the chances for profit in Amherst, for the crops to which reference has been made have not been produced by extravagant use of manure or fertilizer, nor under any system of management not practicable for the average farmer of the State. The average mowings of the State are sadly neglected. Their owners practise, at least, as if they expected "out of nothing to get something." Every season whenever rainfall is deficient and the weather hot we read in the crop reports that "grass in the old mowings is suffering, and will be a very short crop." These old mowings are neglected mowings. They have not been manured or fertilized, or they have not been reseeded; and it is unreasonable to expect they will give good crops, unless the conditions are unusually favorable.

The character of soil which best suits grass is pretty generally understood. The strong, retentive soils which hold moisture well are the natural grass lands. The production of hay upon these can be made most easily profitable; but by suitable selection of varieties of grasses and clovers even some of the lighter soils may be made to yield profitable crops. On the other hand, the State contains large areas of low lands which suffer at the present time from excess of water, and which

are producing an inferior quality of hay for this reason. In many cases such areas can be converted into very profitable mowings if they be first drained. A considerable portion of the 9-acre field in Amherst to which reference has been made was of this character, and the methods of improvement adopted here will be first discussed.

Drainage of Land to be used for Mowing.— Partial drainage by means of open ditches will in many cases greatly improve the character of the herbage produced in land which is naturally wet, but the only thoroughly satisfactory method of improvement is tile drainage. Many no doubt hesitate to undertake tile drainage through fear of inability to carry out the work properly; others are deterred from undertaking it because of the cost. The limits of this article will not permit a full description of the methods to be followed in underdrainage; but the operation, unless the location is such as to offer unusual difficulties, is not very difficult, and no farmer of ordinary capacity need hesitate to undertake it; and the cost, while considerable, will prove a profitable investment, provided the work is carefully done. Many a tract of land in the State, at present producing a crop of swale hay, and which for the production of such hay is worth possibly \$20 to \$25 an acre, can at an expenditure of \$50 to \$60 per acre be made to return a good income on a valuation of from \$150 to \$200.

Preparation of the Soil for Grass.— The fact that very thorough and careful tillage in preparation for crops of all kinds is usually profitable is increasingly appreciated in recent years; and Mr. Clark must be credited with having done much good in emphasizing the desirability and profitableness of thorough preparation of the soil for grass. When practicable, it seems to be best to plow land which is to be seeded to grass some weeks previous to sowing the seed and to give sufficient shallow tillage by means of harrows to bring the surface into a thoroughly fine and mellow condition. If seeding is to be done in the spring, it will in most cases be best to plow in the fall and to complete the preparation in the spring by the use of such harrows as are adapted to the conditions. The disc harrows are very valuable in sod land and in working strawy manures under, but the final preparation should be given by the use of harrows which do not work as deep, and which leave the soil smooth. The Acme harrow is a good implement to follow the disc, while the smoothing harrow is almost always best for the final preparation of the soil for seed. The best condition for the growth of the grass in most soils is obtained by plowing sufficiently long before seeding to permit the soil to settle somewhat, so that when the seed is sown the soil shall be moderately compact underneath, and light and mellow to the depth of a few inches only. When breaking up an old mowing and reseeding without the introduction of a hoed crop, it is best to plow the land as soon as convenient after the first crop of hay is harvested, and then harrow sufficiently often to keep down all weeds and to maintain the surface in mellow condition until the proper time for sowing the seed arrives. In the case of the experiment station mowing, to which reference has already been made and which is referred to again later in this article, the first crop of hay was harvested June 25. The land was plowed on

July 16. Between that date and the date of seeding, which was August 14, the land was harrowed with a disc harrow eight times, and final preparation given with the Acme and smoothing harrow just previous to sowing the seed. The crop of the following year, concerning which particulars are given later, was an exceedingly large one. The season of 1903, it is true, was exceptionally favorable for grass, but the very satisfactory results obtained are believed to have been due in no small degree to the very thorough preparatory tillage which the land received.

Whenever seed is sown in soil which is imperfectly prepared a considerable proportion of it must fail to germinate, and the result is an imperfect sod. There are frequent bare spots in which weeds will later start, and even if this were not the case, it would be found impossible to secure the largest crops of which the land is capable unless the surface is completely covered with grass.

The Selection of the Seeds. — For the past dozen years we have grown in the experiment station in Amherst something like 60 or 65 species of grass annually, each occupying a plot of about one square rod. During all this time these species have been under close observation, and records of their yield in some years and of their general condition have been kept. During this time, moreover, a considerable number of different mixtures of grass seeds have been tried on the different fields of the college farm. As a result of the observation of all these species and the trials of different mixtures above referred to, the conclusion has been reached that in ordinary rotation farming, where the land is left in mowing only some three or four years, to be followed by hoed crops for two or three years, there is no mixture of seeds which will prove more widely adapted to the conditions than the usual mixture of timothy, redtop and clovers. It is the belief of the writer, however, that these seeds should be sown in somewhat larger quantities than are usually advised. The necessity for a close turf, covering every inch of the ground, has been referred to. Such turf is more certainly secured with heavy seeding. It is the belief of the writer, further, that the mammoth red clover should usually be used in this mixture rather than the common red clover, as the former matures more nearly at the same time with timothy and redtop. Most of the soils upon the college farm are retentive of moisture, and on these soils some alsike clover is invariably included in the mixture. Alsike is finer than the red and mammoth clovers, and is especially adapted to moist soils. The mixture of seeds which we usually use is as follows: —

	Pounds.
Timothy, ...	18
Redtop, ...	8
Mammoth clover, ...	5
Alsike clover, ...	4

If a more permanent mowing is desired, it is believed to be best to include other species, for under most conditions timothy does not prove permanent. It gradually gives place to species which are less valuable for hay, — in the eastern part of the State and on the lighter soil in many cases to sweet vernal, farther inland and on the stronger soils to Ken-

tucky blue-grass. The last, although a splendid pasture grass, produces too little top to prove altogether satisfactory in mowings. There is, it is true, no variety of hay which sells so readily in most sections as timothy; but for the reasons stated it seems best to reduce the quantity of timothy, and to introduce species which are more persistent in all cases where the mowing is to be permanent. Among such species the fescues promise to prove the most valuable; and a mixture of seeds in which I have considerable confidence for permanent mowings is as follows:—

	Pounds.
Timothy, ...	6
Redtop, ...	8
Red clover, ...	5
Alsike clover, ...	4
Kentucky blue-grass, ...	4
Meadow fescue, ...	6
Tall fescue, ...	4

The two mixtures of seeds which have been given were sown on the experiment station grounds in Amherst in the summer of 1902, under conditions which make comparison of the results for the first year possible. The mixture including the larger amount of timothy gave a yield in two crops at the rate of about 5 tons to the acre, while the mixture including the fescues gave a yield at the rate of about 4½ tons per acre. The timothy mixture is in the first year clearly superior to the other: but it is expected that the fescue mixture will maintain its quality better, since the fescues which have underground stems similar to those of witch grass are not likely to be displaced by Kentucky blue-grass to the same extent as the timothy.

On soils which incline to be light, orchard grass proves to be one of the most valuable and persistent grasses, and the following mixture of seeds is recommended:—

	Pounds.
Orchard grass, ...	15
Tall oat grass, ...	5
Italian rye grass, ...	3
Perennial rye grass, ...	3
Awnless brome grass, ...	5
Red clover, ...	6
White clover, ...	2

The number of seed mixtures, each of which under some circumstances may prove adapted to the situation, might be almost indefinitely extended, but space forbids further discussion of this branch of the subject.

Methods of Seeding.—The three principal methods of seeding land to grass which will be discussed in this article are: First, spring seeding with a nurse crop; second, late summer or fall seeding; third, seeding in corn.

Spring Seeding with a Nurse Crop.—This system of seeding land to grass is, according to the writer's observation, still one of the most common followed by our farmers. It is of course oftentimes attended with satisfactory results. Grass can usually be depended upon to make

a good start if sown early in spring with a suitable nurse crop; but it far too frequently happens that when the nurse crop is removed (which must usually be late in June or during the month of July) the exposure of the young grass to the hot sun seriously weakens if it does not destroy a considerable proportion of it. At the season of the year when the nurse crop is removed we have our hottest weather, and not infrequently at the same time a marked deficiency of rainfall. With hot and persistently dry weather following the removal of the nurse crop damage to the young grass is certain to be serious on all except the naturally moist and the richer soils. For the reasons which have been indicated, the writer regards this method of seeding as one of the least desirable.

Late Summer or Fall Seeding.—Grass which is sown in suitably prepared soil during the latter part of summer without a nurse crop seldom fails to do well, and where the system of rotation makes it possible to have the land clear at the right time, or in cases where mowings are to be broken up and immediately reseeded, this seems to the writer to be the best time. In many cases seeding is delayed until the middle of September or later, but if this be the case the clover seed is usually left out to be sown the following spring. With suitable weather in spring clover often makes a good start if sown in this way, but a full crop cannot of course be expected the same season. Better results are obtained if the land can be seeded sufficiently early to make it safe to include the clover with the grass seeds. The reseeded of the mowing in the experiment station, which has been already several times referred to, was eminently successful. The clover passed through the winter perfectly, and constituted a large proportion of the crop of hay produced. The month of August is, in the writer's opinion, the best month for seeding to mixed grass and clover; and the most satisfactory results are likely to be obtained if the seed can be got in not later than about the middle of that month.

*Seeding in Corn.**—“Among the various methods which the writer has tried for seeding to grass and clover, he has found the system of sowing in growing corn at the time of the last cultivation, usually from July 20 to August 5, to give most satisfactory results. The culture of the corn must be level, and it must be kept free from weeds. Just previous to sowing the seed a spiketooth cultivator should be used, which will leave the surface fine and mellow. The quantity of seed used should be rather larger than may be required when it is sown alone, as a part of it fails to reach the ground, being caught and retained by the broad leaves of the corn. Dog-day weather should be selected for sowing the seed; and if it can be scattered upon the freshly cultivated surface just before the heavy showers which occur so frequently during dog-days, the seed will need no covering, and will often have germinated within forty-eight hours from the time of sowing. The shade of the corn crop is favorable to the retention of moisture, and on all except the driest soils there will be moisture enough to keep the young plants growing. The corn protects from the sun, but does not crowd. It is not likely to lodge and

* Brooks's Agriculture, Vol. II., p. 426.

stifle the young grass, as a crop of small grain so often does. It is preferable that the seeding be done in a crop of corn destined for the silo. This being carried from the field at once, the grass has the most favorable time of the year to spread and gather strength for the winter. If the corn is grown for grain and must be stooked, there is no great difficulty, but the young plants will be killed where the stooks stand, and these spots must be reseeded either late in autumn or early the following spring. Grass and clover sown in accordance with the method just described become fully established before winter, and are less liable to injury than when sown later. They become sufficiently strong to give a full crop the following year. It is best that the corn be cut low, and the field should be rolled the following spring as soon as it becomes sufficiently firm not to be cut up by horses. Rolling at this time breaks down the corn stubble, which is at that time brittle, and it will be noticed in the hay to a less extent even than is the stubble of a small grain."

When land is seeded in corn the work must be done by hand, but if the field be clear there are a number of machines which will do satisfactory work. Machines of the type of Cahoon's broadcast seed sower will put in any of the seed mixtures which have been given. One objection to machines of this class is the fact that the seed is thrown high into the air, so that satisfactory work can be done only when the weather is relatively calm. The wheelbarrow seed sowers will do somewhat more even and satisfactory work, but these will handle only the relatively small and heavy seeds; the long or chaffy seeds cannot be satisfactorily distributed by the use of these machines. A mixture of timothy, redtop and clovers can be sown with a machine of this type in a thoroughly satisfactory manner.

Manuring Grass Lands.—The question of the proper selection and use of manures and fertilizers for grass lands may be best considered under two general heads: First, manuring in preparation for the crop; and second, top-dressing.

First, Manuring in Preparation for the Crop.—It seems best at the outset under this topic to state as briefly as may be possible some of the facts which seem to be best established as regards the general effects of manures and fertilizers. Some of these facts are equally important in considering the selection of manures and fertilizers for top-dressing. Our movings almost always contain two classes of plants, — grasses and clovers. The manurial requirements of these two classes of plants are, in one important respect, wholly different. Both grasses and clovers require a considerable amount of nitrogen, clovers more than grasses; but the grasses must take all the nitrogen which they require from the soil, while the clovers, if conditions be right, can get most if not all of the nitrogen they require from the air. Whenever land is occupied by two or more species of plants there is a struggle between the different kinds for its possession. If we make the conditions favorable to clovers and less favorable for grasses, the former will predominate. Whether the mowing will produce chiefly grasses or largely clover depends, then, not alone upon the seed sown, but upon the condition of the soil as

regards available nitrogen and available mineral elements of plant food, such as phosphoric acid, potash and lime. If available nitrogen is relatively abundant, then grasses will predominate; if the other elements are relatively abundant, while nitrogen is present only in small amounts, the clovers are likely to predominate. If this is to be the case, however, it is important that all the other conditions required by clover shall be right. Good drainage, thorough tillage and freedom from free acid are essential. From many parts of the State come reports that clover does not thrive. This in many cases is doubtless due to the fact that the soil contains free acid. Under such circumstances a heavy application of lime spread on the rough furrow and deeply worked in with a disc har-



EFFECT OF LIME ON PROPORTION OF CLOVER.

row will be likely to prove effective. The cut which is here presented shows the effect of liming in a striking manner. Both cylinders were filled with carefully mixed soil, taken from one of the fields of the college farm. Both received an application of the same amounts of nitrate of soda, dissolved bone-black and muriate of potash, and in addition one cylinder received an application of lime at the rate of 1 ton per acre. After the application of the fertilizers and the lime, the same kinds and quantities of mixed grass and clover seeds were sown. The result is a most striking demonstration of the efficacy of lime in bringing a sour soil into condition for the production of clover.

In order that the clover may have the capacity to take the nitrogen it needs from the air, it must have the assistance of the bacteria which live in nodules (which are about as large as the head of a pin) on its roots. These bacteria can be supplied either by the application of a few hun-

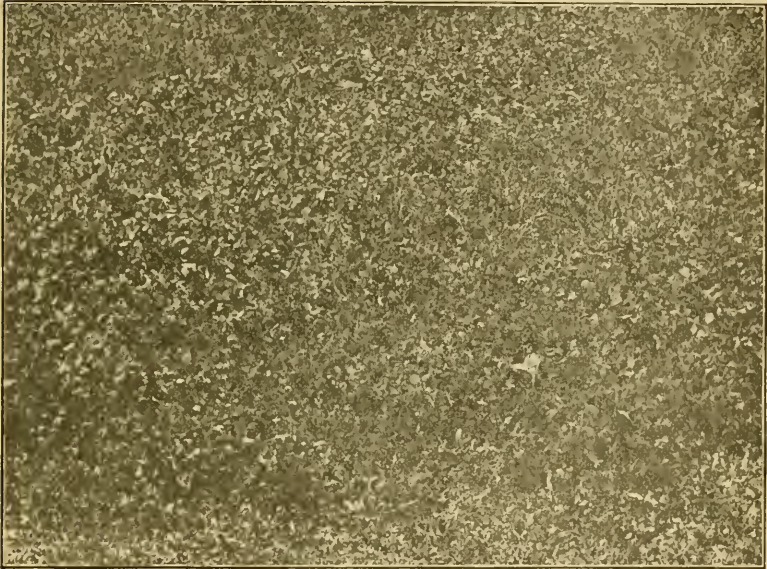
dred pounds per acre of soil from a field where the nodules are found to be abundant on the clover, or by the use of a special culture prepared in the United States Department of Agriculture. It is not believed, however, that it will often be found essential to supply these bacteria. Clover has been so long and so generally grown in this section that these bacteria are practically everywhere abundant; and the nodules will develop upon the roots of clover in practically all situations, provided the conditions essential to the life and activity of the bacteria (which are, in brief, good drainage, thorough tillage and aeration and freedom from free acid) exist. The supply of nitrogen in the air which the clover bacteria under the right conditions bring within the reach of the crop is practically unlimited. It pays, therefore, to make the supply of the elements which clover must take from the soil exceedingly abundant, and among the elements needed potash is one of the most important. In preparation for clover it is believed that the application of from 200 to 300 pounds of a high-grade potash salt, or double that quantity of the low-grade sulfate of potash, will in most cases be useful.

If manure is carefully saved and applied in moderate amounts, clover often does well; but if any considerable proportion of the urine of the manure has been suffered to waste, or if the manure has been exposed to the leaching action of rainfall, there will be a deficiency of potash, which is found chiefly in the urine, and which, being soluble, is easily washed out. If, then, it be desired to bring land on which manure is used for previous crops into good condition for producing a hay crop rich in clover, it will usually be best to supplement the manure by means of an application of potash. From 125 to 150 pounds of a high-grade potash salt per acre, applied in connection with manure to the previous crop, will almost invariably largely increase the proportion of clover in the hay crop when the land is seeded. If fertilizers alone are used for the preceding hoed crops, these must be rich in potash if clover is to thrive when the land is seeded.

Upon the college farm at Amherst we have for about thirteen years applied potash to two plots of one-quarter acre each at the rate of about 250 pounds per acre of a high-grade potash salt. To two other plots the same salt has been applied at the rate of about 150 pounds per acre. When this land is seeded, the hay crop where the larger amount of potash is used is considerably larger and contains a much greater proportion of clover than where the smaller quantity of potash is used. In 1902 the larger application of potash gave a yield at the rate of 6,772 pounds per acre; the smaller application of potash yielded at the rate of 5,252 pounds per acre. For a full understanding of the conditions in this experiment it should be further stated that the quantity of nitrogen applied to the two sets of plots is substantially the same, while the plots receiving the lighter application of potash annually receive an application of acid phosphate at the rate of about 1,100 pounds per acre, and the plots receiving the larger amount of potash acid phosphate at the rate of about 200 pounds per acre. The fertilizer applied where the lesser amount of potash is used is substantially the same in its composition as

average corn fertilizers; while the other, as will have been noted, contains far less phosphoric acid and much more potash.

The kind of potash salt to be selected for clover is a matter of much importance, and experimental results at Amherst have indicated again and again that the sulfate is likely to prove decidedly superior to muriate or to kainit. The cuts presented herewith illustrate the difference in the growth of clovers on the two salts in a striking manner. These two plots were side by side, and both had been manured with equal quantities of fine-ground bone and potash for some eight or ten years. The growth on the sulfate of potash, it will at once be seen, is most decidedly superior to the growth on the muriate. The persistent use



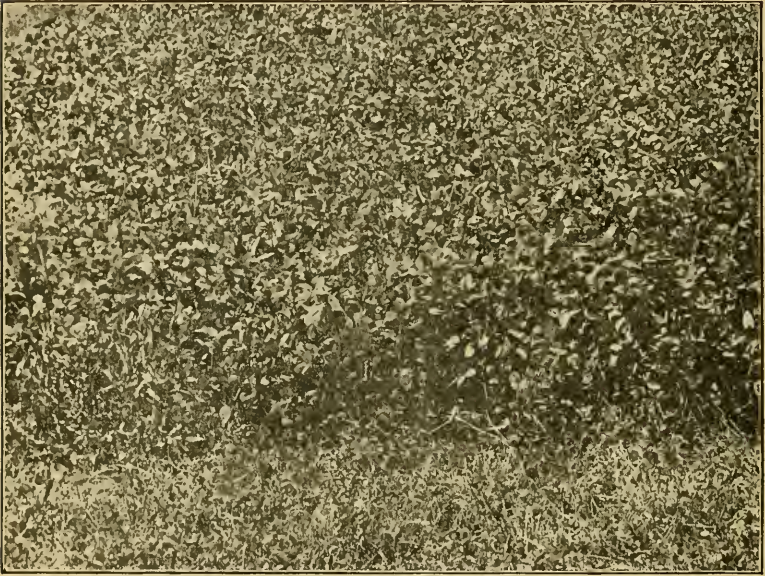
(CLOVER ON MURIATE OF POTASH MAKES A POOR GROWTH.)

of the latter, as indicated by the investigations of Dr Goessmann, appears to cause the loss through leaching of a large amount of lime, and it is perhaps this effect which makes it impossible for the clover to thrive. The difference in the growth of clover on these two salts of potash is invariably greater in relatively wet than in dry seasons.

Conditions affecting the Growth of Timothy and Redtop — Whenever the soil is abundantly supplied with manure or fertilizers which supply nitrogen in relatively large amounts, timothy will be found relatively abundant in the mowing, unless the soil be sour. If it be sour, the redtop will predominate, while, as already stated, there will be little or no clover. If, then, it be desired to produce first-class timothy hay for sale, the farmer should make sure that his soil is not sour; and if found to be so, he must apply lime, as already advised for clover. On soils which are not sour, heavy applications of barnyard manure bring the

land into good condition for timothy; and if it be desired to produce market hay, it will usually be best not to use potash largely in connection with the manure for the crops preceding the grass. For market hay heavy applications of nitrogen manures or fertilizers and relatively light applications of materials containing either potash or phosphoric acid should be the rule.

Second, Top-dressing Grass Lands.— Throughout the State manure is quite largely used for top-dressing grass lands, and every good farmer knows that fine crops of hay can be produced through its use. It may be doubted, however, whether the manure on most of our farms might not be more advantageously used in most cases upon the plowed lands.



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CLOVER ON SULPHATE OF POTASH MAKES A FINE GROWTH.

The elements of value contained in the manure are most certainly conserved for the use of the following crop when the manure can be incorporated with the soil. When it must lie upon the surface it is subject to some loss, chiefly in two ways: First, by the escape of ammonia into the air; and second, by wash over the surface. Further, the manure, unless fine, tends to kill the grass to some extent. The necessity for a close turf for the production of maximum hay crops has been alluded to. If numerous little areas are prevented from full development because covered by lumps of manure, the result must be a not unimportant decrease in the crop. For all these reasons, it is the belief of the writer that under average farm conditions manures should be mainly used on the plowed land, and fertilizers depended upon for top-dressing grass lands. Whenever manure is chiefly depended upon for top-dressing, the grasses will be found to be relatively prominent, for

manure is relatively rich in nitrogen. The use of manure, therefore, is likely to lead to the production of a good grade of hay for market. Manure, if to be used for top-dressing, should be at least partially rotted. It is best to put on in the fall, and a manure spreader is a very desirable implement for the work.

The selection of fertilizers for top-dressing grass lands must be determined largely by the character of hay which it is desired to produce, and it should also be varied according as the mowing is permanent or used in rotation for hoed crops. On mowings which are used in rotation for hoed crops, and where the production of market hay is the object, nitrate of soda should be the most prominent among the fertilizers used; and, while the quantities which it will pay to apply must of course vary with the conditions, the following mixture is suggested:—

	Pounds,
Nitrate of soda, ...	175 to 200
Acid phosphate, ...	50 to 100
High-grade sulfate of potash, ...	50 to 100

These materials should be mixed and applied about May 1. For similar mowings, where a large proportion of clover in the hay is desired, the following mixture of materials is suggested:—

	Pounds.
Acid phosphate, ...	100
Basic slag meal, ...	400
High-grade sulfate of potash, ...	150 to 200

These materials should be mixed and applied either late in the fall or very early in the spring.

For permanent mowings, as well as for those used in rotation, nitrate of soda should be prominent if the production of market hay is the object. The quantity of this fertilizer which may be used must be determined largely by experience. An application which may be safely used on some soils or in some localities will cause the grass to lodge seriously in others. The usual range in quantity which may be profitably used is from about 150 to 250 pounds per acre. The following mixture of materials, although not yet tested for a long period of time on the college grounds at Amherst, is recommended with much confidence:—

	Pounds.
Nitrate of soda, ...	150 to 250
Basic slag meal, ...	300 to 400
High-grade sulfate of potash, ...	75 to 100

For the permanent mowings, where hay rich in clover is desired, an annual application of basic slag meal 400 to 600 pounds, and high-grade sulfate of potash 125 to 200 pounds, will, it is believed, give good crops. The mixture of materials containing nitrate of soda should be put on about May 1, the other mixture late in the fall or early in spring.

It will be readily understood that the mixtures suggested by no means exhaust the possibilities, and they may not under all conditions prove the most desirable. Thus, for example, wood ashes may in many localities give the most profitable returns when used on mowings in which

clover is desired. These may take the place of the slag meal and potash mixtures which have been suggested. The ashes will supply a large amount of lime as well as potash and phosphoric acid. Fine-ground bone is also under many conditions a useful fertilizer, especially in mixture with potash, for permanent mowings where clover is desired. The experiment station plots have been several times referred to. The 9-acre field is divided into three nearly equal plots. Each of these is treated as follows: first year, barnyard manure at the rate of 16,000 pounds per acre, applied in the fall; second year, wood ashes at the rate of 1 ton per acre, applied in early spring; the third year, fine-ground bone 400 pounds per acre, and muriate of potash 200 pounds, mixed and applied in early spring. Each year all three systems of manuring are represented. Our average crops under this system have been heavy, having amounted, as has already been stated, to 6,600 pounds per acre.

Reseeding Permanent Mowings. — That it pays occasionally to reseed permanent mowings is made very evident by the results obtained in Amherst in the season of 1903. A portion of each of two plots in the station mowings was plowed and reseeded in the summer of 1902, as already described. One of these plots was the one top-dressed in 1903 with wood ashes. The yield on the portion not reseeded was at the rate of 6,243 pounds per acre; on the reseeded portion the yield was at the rate of 8,546 pounds. On the plot manured with barnyard manure the yield on the portion not reseeded was at the rate of 5,642 pounds per acre; on the reseeded portion it was at the rate of 10,002 pounds per acre. The manure used on the reseeded portion of this plot was harrowed in at the time the seed was sown. The balance of the plot was top-dressed late in the fall, as usual.

Top-dressing for Rowen. — Experiments extending over several years in Amherst indicate a probable profit from the application of a moderate top-dressing of nitrate of soda immediately after the removal of the first crop. This should of course be made only on mowings where the product is almost exclusively grasses. Top-dressing with nitrate of soda for clover would be a mistake, as this, as already stated, should get its nitrogen from the air. The quantity of nitrate likely to prove useful will usually vary between about 150 and 200 pounds per acre.

MASSACHUSETTS
CROP REPORT

FOR THE

MONTH OF JUNE, 1904.

MUSHROOM GROWING.

*ISSUED MONTHLY, MAY TO OCTOBER, BY STATE BOARD OF
AGRICULTURE, STATE HOUSE, BOSTON, MASS.*

J. LEWIS ELLSWORTH, *Secretary.*

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CROP REPORT FOR THE MONTH OF JUNE, 1904.

OFFICE OF STATE BOARD OF AGRICULTURE,
BOSTON, MASS., July 1, 1904.

Bulletin No. 2, Crop Report for the month of June, is presented herewith. At the close of this bulletin is an article on "The growing of mushrooms," by Dr. George E. Stone, professor of botany at the Massachusetts Agricultural College. This is a subject in regard to which we have had many inquiries, and Professor Stone's article is designed to meet the general desire which evidently exists for information in regard to mushrooms. It is illustrated with cuts showing the structure of the mushroom, the spawn and the kinds of houses in use for their culture. The article is especially commendable, in that it does not hold out too bright prospects, but points out the difficulties in the way of success, as well as describes the methods to be employed.

PROGRESS OF THE SEASON.

Preliminary returns to the Chief of the Bureau of Statistics of the United States Department of Agriculture (Crop Reporter for June, 1904) on the acreage of spring wheat sown indicate an area of about 17,140,800 acres, a decrease of 116,100 acres, or .7 per cent, from the revised estimate of the acreage sown last year. The average condition of spring wheat June 1 was 93.4, as compared with 95.9 at the corresponding date last year, 95.4 on June 1, 1902, and a ten-year average of 93.8. The average condition of winter wheat was 77.7, as compared with 76.5 on May 1, 82.2 on June 1, 1903, 76.1 at the corresponding date in 1902, and a ten-year average of 79.8.

The total reported area in oats is about 27,646,000 acres, a reduction of 86,300 acres, or .3 per cent from the area sown last year. The average condition of oats on June 1

was 89.2, against 85.5 on June 1, 1903, 90.6 at the corresponding date in 1902, and a ten-year average of 89.9.

The acreage reported as under barley exceeds that harvested last year by about 153,000 acres, or 3.1 per cent. The average condition of barley was 90.5 against 91.5 on June 1, 1903, 93.6 at the corresponding date in 1902, and a ten-year average of 89.

The acreage under rye shows a reduction of 6 per cent from that harvested last year. The average condition of rye was 86.3, against 90.6 on June 1, 1903, 88.1 at the corresponding date in 1902, and 89.6, the mean of the corresponding averages of the last ten years.

The total area planted in cotton is estimated at 31,730,371 acres, an increase of 2,823,016 acres, or 9.8 per cent, upon the acreage planted last year. The average condition of the growing crop May 26 was 83, as compared with 74.1 on May 26, 1903, 95.1 at the corresponding date in 1902, and a ten-year average of 85.8.

In Massachusetts the acreage of oats compared with that sown last year was given as 97, and the average condition June 1 as 95; the acreage of rye as 93, and the condition as 93; the acreage of clover as 98, and the condition as 100; the average condition of spring pasture as 99; the average condition of apples as 95; and the average condition of peaches as 31.

TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM UNITED STATES CLIMATE AND CROP BULLETINS.]

Week ending May 30. — With the exception of extreme southern Florida, the week was warmer than usual in the Atlantic and Gulf coast districts, and also in the Ohio valley and over the greater portion of the Lake region. The week averaged slightly warmer than usual over the central portion of the southern Plateau region and on the middle Pacific coast. Over the northern portion of the upper Mississippi valley and in the Missouri and central and northern Rocky Mountain districts the temperature averaged below normal. Heavy rains occurred from east-central Texas northward to the Missouri and upper Mississippi valleys, and also in the Ohio valley and over portions of the upper Lake region and

middle and northern Rocky Mountain districts. In the Atlantic coast and east Gulf States the rainfall was generally much below the average, an extensive area reaching from southern New England to Florida for the most part receiving very light showers or no appreciable amount.

Week ending June 6. — The temperature averaged nearly normal on the Pacific coast and over a considerable portion of the upper Lake region, upper Mississippi and lower Ohio valleys. The week was warmer than usual in California, throughout the southern States, in the upper Ohio valley and in portions of the lower Lake region and Middle Atlantic States. The temperature averaged below the normal in the central and northern Rocky Mountain districts, Missouri valley, in portions of the Lake region and Middle Atlantic coast districts and in New England. Excessively heavy rains occurred during the week from central and northern Texas northward to the Missouri valley and in portions of the central Mississippi and lower Ohio valleys and Middle Atlantic States, while more than the average fell over much of the Atlantic districts and lower Lake region and in the northern Rocky Mountain districts. Along the Gulf coast and over a large part of the upper Lake region and New England the weekly rainfall was below the average.

Week ending June 13. — The week was cooler than usual over much the greater part of the country, being decidedly cool over the north-eastern Rocky Mountain slope and in the central Mississippi and Ohio valleys, New England and the interior portions of the Middle and South Atlantic States. The week was decidedly warm over most of California, and warmer than usual on the north Pacific coast. Generally throughout the central valleys and Lake region the rainfall was very light, a large part of these districts receiving no appreciable amount. General and abundant rains occurred in the Atlantic coast districts south of northern New England. In central Florida, Oklahoma, Indian Territory and portions of western Nebraska and western Kansas the rainfall was unusually heavy. Very light showers occurred in the northern Rocky Mountain region and on the north Pacific coast, but as a whole the rainfall in these districts was below the average.

Week ending June 20.—The week averaged warmer than usual in the upper Missouri valley and over most of the Plateau and Pacific coast States. Nearly normal conditions prevailed over the middle Rocky Mountain slopes and the northern portions of the Lake region and Gulf States and in eastern Maine. Elsewhere the week was cooler than usual, the deficiency ranging from 3° to 6° per day from southern New England to Florida. Heavy rains occurred over a comparatively narrow area, extending from central Kansas and south-eastern Nebraska through Missouri and the southern portions of Illinois, Indiana and Ohio. Elsewhere, except in local areas, the weekly precipitation was below the average, only light showers occurring in the Lake region and Middle Atlantic States, while over a large part of the southern States and throughout the Plateau districts and California there was total absence of rain.

Week ending June 27.—The week was warmer than usual in New England and portions of the lower Lake region and Middle Atlantic States and over the interior of the east Gulf States and lower Ohio valley, but the excess was very slight except in south New England. In the South Atlantic States and over much of the Lake region the temperature averaged nearly normal, but from the Mississippi valley westward to the Pacific coast the week was cooler than usual. From the west Gulf coast and Rio Grande valley northward to and including the lower Missouri valley, and also in Minnesota and portions of the Dakotas and Wisconsin, the rainfall was generally in excess of the average. East of the Mississippi River the rainfall, as a whole, was largely deficient, although numerous small areas received more than the average.

SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

Week ending May 30.—New England. Boston: Weather exceptionally favorable for all crops; much planting done; all early vegetables up and growing well; grass very vigorous; all fruits setting well, with favorable prospects; much tobacco set.

Week ending June 6. — New England. Boston : Weather favorable for crop growth, but unfavorable for farm work ; grass very promising ; all vegetables doing well ; corn backward ; tobacco transplanting well under way, prospect favorable ; all fruits setting exceptionally well ; strawberries fruiting in south ; ground too wet in some localities.

Week ending June 13. — New England. Boston : Weather generally unfavorable, being too cold ; ground in some localities too wet ; grass and grain making rank growth ; peas ripe ; potatoes blooming in south ; much tobacco set, some portions the whole crop ; fruit promises excellent ; cut worms damaging some crops.

Week ending June 20. — New England. Boston : Weather favorable for planting and cultivating, but too cool for crop growth ; rain much needed in Maine ; grass and potatoes very good ; grain fairly satisfactory ; worms greatly damaging onions and cabbages ; other vegetables good ; all fruits excellent, except apples blighting in Maine ; tobacco about all set, outlook satisfactory.

Week ending June 27. — New England. Boston : Weather warmer, with abundant sunshine ; favorable for all crops ; showers of 22d of much benefit, but more rain now much needed ; haying begun, average crop of good quality promised ; potatoes excellent ; cranberries in Bristol and Plymouth counties, Mass., much damaged by hail on 22d ; strawberries excellent ; tobacco hoed and growing well.

THE WEATHER OF JUNE, 1904.

The weather of the month was marked by an abundance of sunny days, and, except in scattered localities, a deficiency in the rainfall. In a few sections violent local storms caused heavy down-pours of rainfall, but over the major portion of the State there was need of rain, and the soil was becoming quite dry during the last half of the month. General showers on the 21st and 22d and on the 25th gave temporary relief to the droughty conditions, and general light rains on the 29th and 30th practically broke the drought. A conspicuous feature of the weather was the rather low temperature during the days and uniformly and exceptionally

cool nights. The daily mean temperatures were below the seasonal average continuously, the 5th excepted, until the 17th, but during the closing decade they were near or somewhat above the normal. At Boston, according to the government records, the mercury did not reach 90° until the 25th, which is an exceptional record for June, and at the close, the same records showed an average daily deficiency in temperature of about one and a half degrees. Generally speaking, the monthly rainfall was little more than half the usual monthly amount, but it was, however, well distributed through the period, and the effect of the deficiency was less marked than if it had been otherwise. Again, the low temperatures were unfavorable to evaporation, and the lack of moisture was chiefly on high lands and at the surface of the ground. Excepting the low temperatures, the weather of June was very pleasant.

In the circular to correspondents, returnable June 24, the following questions were asked : —

1. What insects are proving injurious in your locality?
2. How is Indian corn looking, and what is the acreage, as compared with previous years?
3. Has haying begun, and what is the prospect for the crop?
4. How does the acreage of early potatoes compare with previous years, and what is the promise for the crop?
5. How do early market-garden crops compare in yield and price with former years, and what is the prospect for those not yet harvested?
6. How do the quantity and price of dairy products and the supply and price of dairy cows compare with former years?
7. What is the condition of pasturage in your locality?
8. What is the outlook for such fruits and berries as are grown for market, naming them?

Returns were received from 142 correspondents, and from them the following summary has been made : —

INSECTS.

Less damage from insects is reported than is customary at this time of year. Cut worms are considerably more plenty than usual, and enough reports have been received from onion-growing sections of more than ordinary damage from the onion maggot to indicate that this insect is much more prevalent than common. Potato bugs are the insect most frequently spoken of, but are doing very little damage at present. Tent caterpillars and canker worms are reported as much less prevalent than usual. Other insects mentioned are currant worms, wire worms, squash bugs, cabbage maggots, rose bugs, white grubs, spittle insects, gypsy and brown-tail moth caterpillars, the horn fly, the curculio, plant lice, the cranberry vine worm and the San José scale.

INDIAN CORN.

Indian corn was reported as small and backward at the time of making returns, but generally of good color and otherwise thrifty. The wet weather at the time of planting, together with poor seed in some instances, prevented good germination, and as a consequence the stand is uneven and ragged, many fields having been replanted to a considerable degree. The cold nights of the first two decades of June kept corn from making satisfactory progress, but the warm days and nights at the close of the month must have given it a start, and with warm weather during July and August a fair crop should be secured. Unfavorable weather for farm work at the time of corn planting and the poor crops of the last two years have led to a considerable decrease in acreage, the decrease being distributed through all sections of the State.

THE HAY CROP.

At the time of making returns haying was just beginning in some localities, but not in most sections of the State. By the fifth of July it should be well under way in all sections. Present indications are that the crop will not be more than an average one for the State as a whole, the damage from winterkilling being more serious than was ex-

pected, and the crop generally not promising to fulfil the expectations of a month ago. The quality should be excellent, according to present indications, and those beginning early should secure the crop in good condition. Pressure of other farm work will tend to delay haying beyond the point where best results in quantity and quality of crop could be secured.

EARLY POTATOES.

The acreage of early potatoes is considerably increased for the State as a whole, reports of increased acreage coming from all sections. The crop was somewhat backward at the time of making returns, but generally looked well and gave promise of a good yield. Rain was needed in some sections, and continued dry weather at this time would certainly seriously shorten the early crop. There was some complaint of poor germination, caused by poor seed and wet weather, but it was by no means general, nor sufficient to shorten the crop to any marked degree.

EARLY MARKET-GARDEN CROPS.

Early market-garden crops are perhaps not as far advanced as usual at this time of year, but those harvested have generally made good yields and brought prices fully up to the average. Later crops show good promise, and with seasonable rains should make good yields.

DAIRY PRODUCTS.

The flow of milk has been well maintained, and the amount of dairy products secured up to time of making returns is perhaps slightly in excess of the average for the time of year. Prices show a tendency to seek a lower level, but not sufficiently so to warrant the statement that there had been any general falling off. Dairy cows seem to be somewhat more plentiful than for several years past, with prices correspondingly easier, although really first-class milk producers continue to bring high prices.

PASTURAGE.

Pastures have generally been in first-class condition and given an abundance of feed, but there were indications at

the time of making returns that they were beginning to feel the continued dry weather of the latter half of the month. Rains were certainly needed to keep them up to the high standard of the spring and early summer.

FRUITS AND BERRIES.

Strawberries have given a good crop in some sections and a light one in others, with the result that a fair crop has been secured for the State as a whole. Ripening unusually late they have generally brought good prices. Raspberries and blackberries winterkilled badly in some sections, but elsewhere promise good yields. At the time of making returns they, in common with other small fruits and berries, were beginning to show the need of rain. Currants generally promise well. Plums and cherries set well and promise good crops. Pears will not give as good a yield, the bloom having been light in some sections. Apples appear to have set well and promise a good yield at present, though later reports are needed to allow us to speak with certainty as to the prospect. Peaches will give a good yield in some sections, but will generally be light throughout the State. Wild berries promise well as far as reported on. Cranberries appear to be unusually late in blooming, and in some localities suffered considerable injury from a severe hail storm.

NOTES OF CORRESPONDENTS.

(Returned to us June 24.)

BERKSHIRE COUNTY.

New Marlborough (E. W. RHOADES). — Indian corn is very good color, but much seed failed to germinate. Haying will begin about July 5, with fair prospects of a full crop, although old meadows are poor in places. There is a largely increased acreage of early potatoes and they promise well. A large quantity of milk has been produced; native beef is called for at good prices. Pastures are in good condition, but rain is needed to keep them so. Cherries are a full crop, but the birds get large quantities of the best of them; plums growing finely.

Alford (L. T. OSBORNE). — There are very few insects and potato bugs were never so scarce. Corn is rather late, but on the whole is looking well, with acreage rather larger than last year. Haying has just begun, with a full average crop, but rather more winterkilled than was at first supposed. The acreage of early potatoes is larger than usual and the crop is very promising. Quantity and price of dairy products and supply and price of dairy cows are about as in the past two years. Pastures are in very fine condition and seem to have been less injured by the cold winter than meadows. Apples promise a large crop and pears a poor one.

Richmond (T. B. SALMON). — Potato and squash bugs are doing some damage. Indian corn is in very good condition; acreage about average. Haying has not begun and the prospect for the crop is very good. There is about the usual acreage of early potatoes and there is good promise of a crop. Early market-garden crops are little raised, but what there are look very well. More than the average quantity of dairy products produced at good prices; cows are high and good ones scarce. Pasturage is in very good condition. Strawberries good; raspberries dying of some disease of the canes; currants looking well; cherries good and blackberries average.

Becket (WM. H. SNOW). — Potato bugs, currant worms and tent caterpillars are doing some damage. Indian corn is late and less than the usual acreage has been planted. Haying has hardly

begun, but there is the prospect of a good crop. There is about the usual acreage of early potatoes and they are generally looking well. Early market-garden crops compare well with former years in yield and price. Dairy cows are a full average in supply and price. Pastures are in good condition. Strawberries, raspberries, blackberries and huckleberries promise well. The season has been late, but crops look well and are growing fast.

Hinsdale (T. F. BARKER). — There is no complaint of insects doing damage. Indian corn is looking well and the acreage is about an average one. Haying has not begun, but there will be a fair crop except where killed by ice. There is a full average acreage of early potatoes and they are looking well. Early market-garden crops are fully up to the average. There is no change worthy of notice in the quantity and price of dairy products or the supply and price of dairy cows; some cows are offered for sale. There is a short crop of strawberries, but a large crop of blackberries is promised.

Hancock (C. H. WELLS). — Currant worms are doing some damage, but potato bugs have not been very troublesome as yet. Most fields of corn are rather small; acreage about the same as last year. Haying has not begun yet; new seeded fields look well, but old meadows are very thin and poor. Very few early market potatoes are raised, but the crop promises well at present. Butter is plentiful and brings 25 cents per pound; good dairy cows bring from \$40 to \$45. Pasturage is better than usual. No berries raised for market; apples promise an abundant crop.

Windsor (H. A. FORD). — A few potato bugs are the only insects which have appeared as yet. Indian corn is very small, but will give a good crop with warm weather; acreage about as usual. Haying has begun, with prospect good for the crop. Acreage of early potatoes fully up to the average, but they are rather backward. Market-garden crops are not raised. Butter not as high as last year, but prices of cows about the same. Pastures are in extra fine condition. Strawberries winterkilled somewhat, but otherwise give quite a good crop.

Cheshire (L. J. NORTHUP). — Wire worms seem to be our most injurious insect; tent caterpillars and potato bugs are not plenty. Corn is not up to the normal, but the acreage is about the same as usual. Haying has not begun; the prospect now is for a large crop of good quality. The acreage of early potatoes seems to be increased as compared with former years. The yield of early market-garden crops promises well and prices are high. Dairy products are abundant and prices well sustained. Pastures are holding out well, but now need rain. Strawberries are plenty;

blackberries promise a good crop; cherries are somewhat plenty; other fruits looking well.

New Ashford (ELIHU INGRAHAM). — Tent caterpillars are doing some damage. Indian corn is small and backward, but with an average acreage. Haying has begun and there is prospect of a fair crop. There is an average acreage of early potatoes and they look fairly well. Average quantity and price of dairy products; dairy cows in good supply at usual prices. Pasturage is in good condition. Fruits and berries are not grown for market.

FRANKLIN COUNTY.

Colrain (A. A. SMITH). — Cut worms are doing some damage. Indian corn is looking finely and the amount planted is larger than usual. Haying has begun and the prospect is that the crop will be good. The acreage of early potatoes is increased and the crop promises well. Quantity and price of dairy products the same as in former years. Pastures were never in better condition. The outlook is good for cherries, currants, strawberries and wild berries of all kinds.

Leyden (U. T. DARLING). — There is but little damage from insects. Indian corn is looking very well, but is small for the time of year; acreage not above the average. Haying has hardly begun and there will not be over an average crop. The acreage of early potatoes is increased and the promise is very encouraging for a good crop. Very little is done here in the way of market-gardening. The quantity of dairy products is good, but prices are a little under last year. Pasturage is in good condition. Blackberries and raspberries are looking well.

Shelburne (GEO. E. TAYLOR). — No insects are doing damage. Corn is looking very well and the acreage is about average. Very little hay has been cut, but an average crop is expected. More potatoes than usual have been planted, and they promise well, though backward. Quantity and price of dairy products about as last year; supply of dairy cows short. Pasturage is in fine condition, but needs rain. Plums, blackberries and currants will be plenty; apples set very well.

Hawley (C. C. FULLER). — There has not been much damage by insects. Indian corn is looking fairly well, with about the usual acreage. Haying has begun on early farms and there is prospect of a good crop. Acreage of early potatoes about the same as usual and prospect of a fair crop. We have no market-garden crops. Dairy products about normal, and dairy cows bringing good prices. Pastures are in fair condition, but need rain. There is a

fair crop of strawberries and other small fruit ; prospect for apples good.

Ashfield (CHAS. HOWES). — Potato bugs are the only insects doing damage. Indian corn is late, but within a week has made good growth ; some seed did not germinate ; usual acreage. Haying has just commenced, with the prospect of a good crop. There is about the usual acreage of early potatoes and the crop is looking finely. Quantity of dairy products large, but prices lower than formerly ; dairy cows plenty and prices fair. Pastures are in excellent condition. Apples are about the only fruit raised here for the market and there is prospect of a good crop.

Sunderland (J. M. J. LEGATE). — Onion maggots are more numerous than for years, and cut worms are also doing some damage. Corn is very late and crows are pulling badly ; acreage about the same as usual. Haying has not begun and the crop will be a good average one, though not as heavy as was thought at one time. Potatoes look well, with the usual acreage. Pastures are in fine condition, but need rain soon, as do all crops. Berries are looking finely ; strawberries a heavy crop ; raspberries looking finely, but, with all other berries, need rain very much.

Montague (C. S. RAYMOND). — Cut worms are doing some damage. Indian corn is looking well, but most of it is late ; acreage about the same as usual. Haying has not begun and the crop will be about average. Acreage of early potatoes about the same as usual and looking very promising. Prospect for market-garden crops very good and prices about as in other years. There is not much change in either the quantity and price of dairy products or the supply and price of dairy cows. Pasturage is in very good condition. All kinds of fruit and berries promise good yields.

Wendell (N. D. PLUMB). — Tent caterpillars and potato bugs are doing some damage. Corn is the best crop for three years. The hay crop looks very promising, but no haying has been done as yet. There is the largest acreage of potatoes for years, and if rain comes soon we will have a big yield. Dairy products are about normal in quantity and price, as are also dairy cows. Pastures are in good condition. Berries and fruit of all kinds never looked more promising.

New Salem (DANIEL BALLARD). — There is some damage from squash and potato bugs. Indian corn is backward, but appears to be starting well, with the usual acreage. Few have commenced haying, but there is promise of a good crop. The acreage of early potatoes is about average and is looking well. But little is done in market-gardening. Dairy products are in good supply and bring fair prices ; there is little demand for dairy cows. Strawberries plenty ; apples promise fair yield.

HAMPSHIRE COUNTY.

Prescott (W. F. WENDERMUTH). — Potato bugs are doing some damage. Corn is backward fully ten days ; acreage 90 per cent of the normal. Haying has not yet begun, but a full average crop is in prospect. Acreage of early potatoes about as usual and condition normal. Quantity of dairy products a little above the average and prices a little below ; good cows command good prices. Pasturage is in good condition. Apples have failed to such an extent that the crop will not be anything near what the bloom promised.

Amherst (WM. P. BROOKS). — Onion maggots are doing an exceptionally serious amount of damage ; potato bugs and cabbage maggots are also present. Indian corn is very small for the season, but on all except exceptionally wet fields looks healthy and is growing well. Haying has not generally begun, but the crop is exceptionally heavy. Acreage of early potatoes slightly increased and condition of crop good. Peas extra good ; other market-garden crops average ; prices good. No material change in quantity and price of dairy products or in supply and price of dairy cows. Pastures are in excellent condition. Strawberries are a good crop ; raspberries and blackberries winterkilled badly ; apples and currants promise well, though some varieties of apples did not set well.

South Hadley (H. W. GAYLORD). — Potato bugs and currant worms are doing some damage, though not unusually plenty. Corn has looked poorly, but the past few warm days have improved it very much ; acreage increased 12 to 15 per cent. Very little grass cut as yet ; crop not as good as expected, being one-fourth short on many fields. Acreage of early potatoes increased 15 per cent and they are growing finely ; less late potatoes than usual planted. Market-garden crops are below average in general condition, but prices are unusually good. Quantity of dairy products fully up to the demand and prices slowly declining. Pastures are poor in many places, owing to stock being turned into them too early. Strawberries are very plenty and fine ; raspberries and blackberries look promising ; currants not up to the average.

Northampton (H. C. COMINS). — Potato bugs are doing some damage. Indian corn is very backward and uneven ; acreage about the same as in other years. Not much haying done yet, but there is prospect of a very heavy crop. The acreage of potatoes is increased and they are looking finely. Early market-garden crops are rather short, but prices are good ; prospect only fair for later ones. Quantity of dairy products good ; cows are abundant

and prices relatively low. There is an abundance of good feed in pastures. Strawberries abundant and good; blackberries badly winterkilled and will be a light crop.

Southampton (C. B. LYMAN). — The potato bug is doing some damage. Indian corn is backward and has just commenced growing, with about the average acreage. A few have commenced haying, with a fair but not an extra crop. Not much is done here in early market-garden crops. Early potatoes are fully up to the average in acreage and the prospect for the crop is very good at present. The quantity and price of dairy products and the supply and price of dairy cows are about up to the average. Pastures are rather poor. Fruits and berries are not much grown for market, but what there are are looking finely.

Westhampton (H. A. PARSONS). — Potato bugs are doing some damage. Indian corn is backward. Haying has begun and there is a good crop. The acreage of early potatoes is about the same as usual, and they are looking well. Not much is done here in market-gardening. Dairy products are bringing good prices and also dairy cows. Pasturage is in good condition. Apples are looking well; high-bush blackberries promise a good crop.

Chesterfield (HORATIO BISBEE). — We are having but little trouble from insects as yet. Corn is looking fairly well, with the acreage decreased from last year. Haying has not begun, but the prospect is fair for the crop. The acreage of early potatoes is fully as large as usual and they are looking well. Early market-garden crops are not raised here to any extent. Dairy products are rather low in price; cows not very plenty, with prices well up. Pasturage is in fairly good condition. Apples are about the only fruit grown, and the prospect for the crop is fairly good.

Goshen (ALVAN BARRUS). — Very little if any corn will be planted except for ensilage. Only dooryard grass has been cut as yet, but a heavy crop is in prospect. Early potatoes, though limited in acreage, are looking finely, and some are in blossom. As a rule, gardens are late; those planted early are doing well. Dairy products compare favorably in quantity and price with former years. Pastures are in first-class condition. Apples promise a heavy crop; pears and peaches light; small fruits full crops.

Cummington (S. W. CLARK). — Very little trouble from insects. Indian corn is very backward and the acreage less than usual. Haying is beginning a little and the prospect for the crop is very good. The acreage of early potatoes is about as usual. Quantity of dairy products fully up to former years, but prices a little lower; cows plenty. Pastures are in very good condition. Apples are the main fruit grown for market and the prospect is very good at present. Most crops are in need of rain.

HAMPDEN COUNTY.

Blandford (ENOS W. BOISE). — Tent caterpillars are doing some damage. Indian corn is small and looks poorly; not over half the usual acreage planted, many putting in barley or forage crops instead. Haying has not begun; crop good on rich hillside fields, but permanent mowings winterkilled badly, and the crop will not be over two-thirds. About the usual acreage of early potatoes, and they are looking well. Full average quantity of dairy products, and prices about as usual; little call or sale for dairy cows and good ones have been sold for about \$40. Pasturage is in good condition. Apples are our main fruit crop for market; wild blueberries and blackberries promise well.

Russell (E. D. PARKS). — Cut worms, wire worms and potato bugs are doing some damage. Corn is backward, but looks well otherwise; acreage average. Haying has begun and a very good crop will be secured. Acreage of early potatoes about as usual, and they are looking very well. Market-garden crops little grown. Quantity and price of dairy products and supply and price of dairy cows well up to the average. Pastures are in very good condition. All small fruit is doing nicely.

West Springfield (J. N. BAGG). — Currant worms and squash bugs are doing some damage. Haying has just begun, with the prospect of a fair crop. There is about an average acreage of early potatoes. Early market-garden crops compare well in yield and price with former years, and the prospect is good for those not yet harvested. Dairy products bring higher prices than in former years. Pasturage is in good condition. Strawberries plenty; apples and pears an average; quinces light; no peaches.

Agawam (J. G. BURT). — Potato bugs are doing some damage. Indian corn looks well, with about the usual acreage. Haying has not yet begun, but a good crop is promised. The acreage of early potatoes is about the same as usual and the crop will be good with rain. Early market-garden crops are about average in yield and price; prospect good for later ones if not too dry. Dairy products are about normal in quantity and price. Pasturage is in good condition. Strawberries, raspberries and pears are the fruits and berries grown for market and all promise well. Everything needs rain.

East Longmeadow (J. L. DAVIS). — Cut worms and potato bugs are doing some damage. Indian corn is a little backward; some fields came up badly and had to be planted over; a full acreage planted. Haying has begun, but there will hardly be a full crop as it is very light on old seeding. There is about the usual acre-

age of early potatoes and the crop is looking very well, though cut worms did some damage. Yield and price of early market-garden crops average and prospect for later ones good. Price of milk a little less than last year; cows about the same in supply, with price in favor of the buyer. Pastures are in very good condition. Apples good; pears and peaches poor; strawberries plenty.

Ludlow (J. N. ISHAM). — Potato beetles and currant worms are just commencing to work. Owing to immature seed many fields of corn have had to be replanted, making the fields look very uneven. Haying has barely begun, but a good start will be made next week by most farmers. A slight increase in the acreage of early potatoes is noticeable, and the prospect is promising for a good crop. All garden crops compare well with former years. Quantity and price of dairy products a full average, and dairy cows bring good prices. Pasturage has been excellent so far, but is just beginning to be dry in spots. Fruit bloomed well, but there is much dropping from the trees, especially of pears; apples doing fairly well; most plum trees need thinning.

Monson (F. D. ROGERS). — Plant lice are our only troublesome insects and they are not doing serious damage. Indian corn is looking well, but is very late, as much had to be planted over. No haying done yet, but the crop is looking well where not winter-killed. There is about the usual acreage of early potatoes. Quantity and price of dairy products and supply and price of dairy cows about the same as last year. Pastures are in fair condition, though the recent cold nights and dry weather kept grass from growing. Strawberries are a fair crop and bring good prices.

Palmer (O. P. ALLEN). — Few insects are present in any marked degree. Corn is looking quite well considering the backward season, and there is about the usual acreage. Little haying has been done and there will be a fair crop. No marked difference from other years in yield and price of early market-garden crops and later ones promise well. Quantity and price of dairy products remain the same as usual. Pasturage is in very good condition. The prospect is good for small fruits, but there is some complaint that plums and early apples are falling off.

Holland (FRANCIS WIGHT). — No insects are doing particular damage. Indian corn is small for the time of year, with about the usual acreage. Haying has not commenced yet and grass is thin on many fields. There is an increased acreage of potatoes and they are looking well. Dairy products and prices are about normal; price of cows about as usual. Feed is good in pastures. All berries promise fairly good crops.

WORCESTER COUNTY.

Brookfield (F. E. PROUTY). — Corn is about ten days late and the acreage is about two-thirds that of the last two years. No haying as yet, but the prospect is good for an average crop. Acreage of early potatoes about the same as usual and prospect for the crop good. Early market-garden crops are about the same as usual in yield and price and later ones promise well. The quantity and price of dairy products are about the same as usual. Pastures are in good condition. Strawberries are about the only berry grown for market and they are a good crop.

North Brookfield (JOHN H. LANE). — A few potato bugs are doing some damage. Much corn has been replanted and it is looking very uneven. Very little haying has been done as yet and the crop will be light, as much grass winterkilled and white grubs are working badly. The acreage of early potatoes is increased 20 per cent and they are looking finely. Quantity of dairy products same as usual, but prices lower for milk. Pasturage is in good condition. Fruit and berries are very uneven in condition and unsatisfactory to estimate results for.

New Braintree (C. D. SAGE). — Spittle insects, cut worms and potato bugs are doing some damage. Condition and acreage of Indian corn about average. Very little hay has been cut; looking well, but winterkilled in places. More early potatoes than usual have been planted and they are looking finely. Early market-garden crops little grown; prospect for later ones good. The quantity of dairy products is in excess of average years, but prices are lower than usual. Pastures are looking finely, never better. There is a fine prospect for abundant crops of all kinds of fruits; small fruits little grown.

Barre (J. L. SMITH). — Cut worms are doing some damage. Indian corn is late and the acreage is less than usual. Haying has not begun; crop average, though it does not look as well on close examination as was expected. The acreage of early potatoes is about the same as usual, but they are late. Milk brings good prices for what can be shipped to Boston, but the amount is restricted; prices of cows about the same as last year. Apples are a large crop.

Templeton (LUCIEN GOVE). — Potato bugs, currant worms, squash bugs and cabbage maggots are doing some damage. Haying has begun to a limited extent and there will be more than an average crop. Early potatoes are fully average in acreage but late and uneven. Indian corn is very poor, uneven and backward; less than the usual acreage planted. Market-garden crops are late

and poor, with prospect uncertain for later ones. Quantity of dairy products more than usual, but prices much lower for butter; selling value of dairy cows about as usual. Pasturage is quite good, much better than last year. Blackberries and raspberries winterkilled badly.

Royalston (C. A. STIMSON). — No insects are doing damage. Corn is small and backward; acreage about as usual. Haying has not begun to any extent, but there is prospect of a good crop. Acreage of early potatoes increased 25 per cent and the promise for the crop is good. The quantity of dairy products is increased and prices are higher. Pasturage is in good condition. Strawberries, blackberries, raspberries, apples and pears are the berries and fruits grown for market, and all promise good yields.

Gardner (A. F. JOHNSON). — Potato bugs are doing some damage. Corn is coming up nicely; no increase in acreage. Haying has not yet begun, but the prospect is for a good crop. Market-garden crops of all kinds are looking finely. There is no change in the quantity and price of dairy products and the supply and price of dairy cows. Pasturage needs rain. Berries promise good crops and there is prospect of a big crop of apples.

Ashburnham (E. D. GIBSON). — Cut worms are doing the most damage of any insect, but are not very injurious. Acreage of Indian corn less than usual; crop backward but gaining. Haying has not begun, and the crop will not be an average one except with plenty of rain. Acreage of early potatoes about as usual, and it is too early to predict as to the crop. Quantity and price of dairy products and supply and price of dairy cows about as last year. Pasturage is only fair, having been injured by the severe winter. No berries grown for market; wild berries promise well.

Sterling (H. S. SAWYER). — Currant worms are the only insects doing damage. Indian corn is backward, and less planted than in previous years. Very little haying has been done as yet, but the prospect for the crop is good. There is a large acreage of potatoes planted and they promise a good crop at this time. Market-garden crops average about as usual; prospect good for crops not harvested. Quantity and price of dairy products about the same as last year; good cows not plenty, price from \$50 to \$70 each. Pasturage is looking well, but rain is needed to keep it up. Strawberries are less than an average crop; raspberries winterkilled; blackberries look promising. Early cabbages are not promising well, owing to damage by maggots.

Bolton (H. F. HAYNES). — Potato bugs have begun to work, but not seriously. Indian corn mostly failed to germinate and was ploughed up. Not much haying has been done as yet, but the crop

will be good. There is about the usual acreage of early potatoes and they are looking well. Quantity and price of dairy products fully up to the normal. Pasturage is in good condition. Strawberries are a good crop; raspberries badly winterkilled and blackberries entirely so.

Northborough (JOHN K. MILLS). — Potato bugs and cut worms are doing some damage. Corn is uneven on some fields, while others look well; there is a full acreage. But little haying has been done as yet, and there will be a full crop. Acreage of early potatoes about as usual; some fields look well, while poor seed caused poor germination on others. There has not been a heavy yield of early market-garden crops as it has been too cold, but prices have been fully as high as last year. Butter and milk are selling lower than last year; little demand for cattle and prices low. Pastures are in the best of condition. Strawberries, pears, grapes and apples give promise of good yields; peaches, blackberries and raspberries have been such uncertain crops that the land devoted to them has been much reduced, and there will be few if any for market.

Shrewsbury (FRED J. REED). — Rose bugs, potato bugs and onion and cabbage maggots are doing some damage. Indian corn is very backward and many have planted it over the second or third time. Very little haying has been done as yet, but a good crop is in prospect. There is about the usual acreage of potatoes and they are looking well. Market-garden crops are looking well; prices about the same as last year; prospect for later ones good if we have rain. Milk seems to be plenty; price of dairy cows a little lower than usual. Pastures are in need of rain. Strawberries have been very good, but are in need of rain.

Hopedale (DELANO PATRICK). — There is but little damage from insects. Indian corn is very backward and much has been replanted; mostly grown for fodder. Some are about commencing haying; crop very good and growing fast now. The acreage of early potatoes is fully up to the average; crop good but backward. The quantity and price of dairy products are both above average; cows more plenty than formerly and prices a little lower. Pastures are in very good condition.

MIDDLESEX COUNTY.

Hopkinton (W. V. THOMPSON). — Cut worms and striped squash bugs are doing some damage. Indian corn looks well but is a little late; acreage the same as usual. Haying has not begun and unless we have rain the crop will be light. The acreage of early potatoes

is normal and the crop looks well. The milk supply goes to Boston; cows are about the same in price as in former years. Pasturage was good, but is drying up. Fruits and berries started well, but now need rain.

Marlborough (E. D. HOWE). — Potato bugs and rose bugs are doing some damage, but not much. Indian corn is about two weeks late; acreage normal. Haying has just begun, with the prospect of a good crop. There is the usual acreage of early potatoes and they are looking well. Very little is done here in market-gardening. Prices for dairy products have been stationary for years, quantity sufficient; cows in fair supply, at from \$50 to \$60. Pastures are in as good condition as is usual at this season. Strawberries are a good crop; currants a three-fourths crop; raspberries a full crop; apples three-fourths; peaches 10 per cent; pears a three-fourths crop.

Stow (G. W. BRADLEY). — Rose bugs and potato bugs are doing some damage. Corn is rather backward, with a smaller acreage than usual. A few have begun haying, with the prospect good for a large crop. The acreage of early potatoes is about the same as usual and they are looking well at present. Nothing is being done in market-gardening to any extent. Dairy products are a little below average in quantity and price; supply and price of cows fair. Pasturage is in very good condition for the season. Apples and pears are looking well; strawberries a heavy crop; blackberries largely winterkilled.

Townsend (G. A. WILDER). — Tent caterpillars are doing some damage. Indian corn is about normal in condition and acreage. Haying has begun and there will be better than an average crop. The acreage of early potatoes is about the same as usual and they are looking very well. Quantity and price of dairy products and supply and price of dairy cows about the same as usual. Pastures are in very good condition. The outlook is good for fruits and berries grown for market.

Dunstable (A. J. GILSON). — Potato bugs, cut worms and rose bugs are doing some damage. Indian corn is small but of good color, and the acreage is about the same as usual. Haying has not begun, but the prospect is good for a normal crop. Only about enough early potatoes for home use are raised and they are growing finely. No early market-garden crops raised. The quantity and price of dairy products are about the same as usual, while dairy cows are lower in price. Pastures are holding out well. The outlook is good for apples, and small fruits are doing well.

Westford (J. WILLARD THATCHER). — No insects are doing dam-

age. Indian corn is looking well, with about the usual acreage. Some have begun haying and the prospect is for a good crop. There is an increased acreage of early potatoes and they now promise a good crop. Dairy products are a drug in this locality. Pastures are in good condition. Strawberries, raspberries and blackberries promise good crops.

Carlisle (E. J. CARR). — Potato bugs and squash bugs are doing some damage. Indian corn is very backward, but fully as much as usual has been planted. A few have commenced haying and a big crop will be secured, with the quality first class. More early potatoes have been planted than in former years, and they promise well though a little late. Asparagus has yielded well, prices lower than last year; peas look well. There is a big yield of milk at good prices; cows are plenty but prices are high for good ones. Pastures are in the best of condition. Strawberries are yielding well; apples set well; blackberries and raspberries promise well.

Concord (WM. H. HUNT). — Insects are less troublesome than usual, asparagus beetles being most noticeable. Corn is backward from the cold nights, but is gaining; acreage about average. Haying has commenced and there will be a good crop. There is about an average acreage of early potatoes, which are looking well but a little late. Not many market-garden crops have been harvested; there has been a good crop of asparagus. Dairy products are about average in price and quantity. Pastures are in good condition. Strawberries are doing well; pears will be a light crop; apples promise well.

Winchester (S. S. SYMMES). — Gypsy moth caterpillars are doing much damage. Indian corn is not raised. Haying has begun and there will be a heavy crop. Potatoes are backward. Market-garden crops give good yields and bring good prices, with prospect good for later ones. Pasturage is in first-rate condition. Strawberries are a good crop, with the demand better than usual.

Stoneham (J. E. WILEY). — Brown-tail moths are doing some damage. Indian corn is not raised. Haying has begun and there will be a good crop. Acreage of early potatoes about the same as usual and prospect for the crop good. Early market-garden crops are a little above the average in yield and price, and the prospect is good for later ones. Pastures are in good condition. Strawberries and currants give good yields.

ESSEX COUNTY.

Haverhill (EBEN WEBSTER). — Canker worms and tent caterpillars are doing some damage. Corn is rather backward, with

about the usual acreage. Haying is just beginning, with about a normal crop in prospect. Early potatoes are looking well and promise a fair crop. Dairy products are normal in quantity and price, as are also dairy cows in supply and price. Pasturage is in good condition. Strawberries are a good crop; cherries not plenty.

Groveland (A. S. LONGFELLOW). — Cut worms are doing the most damage of any insect. Corn is growing fast, but is small because of late planting; little change in acreage. No haying done yet, but a good crop is assured. Early market-garden crops are up to the average in yield and price. Dairy products are plenty and cheaper than usual; cows also cheaper. Pasturage never was better. Strawberries promise well but are late; apples and pears set well; some peaches.

Rowley (D. H. O'BRIEN). — Potato bugs are very numerous and onion maggots are quite plenty. Indian corn is looking poorly and there is not as much planted as usual. A few have begun haying and the crop will be unusually heavy. There will be about the usual acreage of early potatoes, and they are now looking very well, although later than usual. Market-garden crops are about normal. The supply of dairy products is about normal, with prices a little lower; extra good cows are high, medium ones rather cheap, and poor ones plenty, but with no sale for them. Pasturage is in extra good condition. Strawberries a light crop; pears and apples good; no peaches.

Wenham (N. P. PERKINS). — Onion maggots, squash bugs and cut worms are doing some damage. Not much field corn is planted in this vicinity; sweet corn and ensilage corn are not as forward as usual. Haying has commenced, but not to any great extent; crop not much better than last year. The acreage of early potatoes is quite large, but on many fields seed has come up poorly and the prospect is not good. Yield of milk fairly good, with prices about the same as usual, but some complaint just now of falling off in yield. Pastures are looking well, but feed does not seem to be as sweet as usual. Strawberries are quite plenty and prices low.

Manchester (JOHN BAKER). — Potato bugs, striped squash bugs and a few brown-tail moth caterpillars are doing damage. Corn is in very poor condition, with acreage about the same as usual. Haying has just begun and the prospect is good for a good crop. Acreage of early potatoes about the same as usual, with crop promising well. Early market-garden crops are good; average in yield and price; prospect good for later ones. Quantity and price of dairy products and supply and price of dairy cows about as

usual. Pastures are in excellent condition. There will be fair yields of strawberries, currants, raspberries and blackberries.

Danvers (CHAS. H. PRESTON). — Brown-tail moths are doing some damage. Corn is backward, with about the usual acreage. Haying has begun and a good crop will be secured. There is an average acreage of early potatoes and the promise for the crop is good. Early market-garden crops have turned out fairly well in yield and price, and the prospect is fair for later ones. Pasturage is in good condition. Strawberries are yielding well, and plums and apples promise fair crops.

NORFOLK COUNTY.

Randolph (R. A. THAYER). — Potato bugs are doing a limited amount of damage. Indian corn is quite small for the season, with about the usual acreage. Very little hay has been cut as yet, but there will be more than an average crop. About the usual amount of early potatoes have been planted and they promise an excellent crop. Peas and other early market-garden crops are yielding well and bring fair prices. There is a good average quantity of dairy products, with cows at usual prices. Pastures are in excellent condition. Strawberries will be a large crop and raspberries promise well.

Walpole (E. L. SHEPARD). — Potato bugs and rose bugs are doing some damage. Corn looks small and backward; acreage about the same as usual. Haying has begun; the present dry spell is pinching the crop, but with some good showers there would be a good crop. There is about the usual acreage of early potatoes and they are looking finely, and late ones are doing well. Yield of early market-garden crops below average, prices rather higher; rain needed for those not harvested. Milk plenty and price same as last year; cows plenty and prices not as high as last year. Pastures are looking very good. Apples, pears and peaches will give rather light yields; strawberries need rain to make a fair crop; blackberries and blueberries looking fairly.

Norfolk (A. D. TOWNE). — Cut worms have done considerable damage, other insects not more than usual. Corn is late and backward, mostly planted for ensilage and fodder; acreage decreased. Some farmers have commenced haying, and there will be a good crop on all land that was properly cared for. Acreage of potatoes increased somewhat and prospect for the crop good at the present time. Dairying in this locality has become a lost art. Pasturage is in good condition. Apples and plums full crops; pears light; grapes good; strawberries yielding well. There was some injury from frost on low lands the 13th inst.

Franklin (C. M. ALLEN). — Potato bugs are doing some damage and the San José scale is troubling our orchards somewhat. Indian corn is backward, and the acreage is less than usual. But little hay has been cut; prospect for a good average crop. Acreage of early potatoes large and they are looking finely. Yield of early market-garden crops good and prices fair; prospect fair for later ones. Dairy products plentiful; cows in good supply and prices easy. Pasturage is in very good condition. Strawberries are a good crop; blackberries and raspberries winterkilled somewhat. The cold winter and wet spring have made many of our crops a little late, but on the whole crops are looking better than average.

BRISTOL COUNTY.

Mansfield (WM. C. WINTER). — Curculios, rose bugs and currant worms are doing some damage; potato bugs not as plenty as usual. Indian corn is looking poorly, rather backward; not much grown here. Haying has not begun; crops above average, lodged in places by the severe hail storm of the 21st. Acreage of early potatoes about as usual and looking fairly well, but beaten down and cut by hail. Price and quantity of dairy products rule about as usual. Pasturage is in very good condition. Strawberry crop light, prices a little higher; apples looking well; pears medium; plums medium; no cherries; grapes poor; currants and strawberries medium; huckleberries quite promising.

Easton (H. M. THOMPSON). — Potato bugs and cut worms are doing some damage. Corn is backward and does not appear thrifty, owing to cool weather. The hay crop is not up to expectations and haying has not yet begun. Acreage of early potatoes fully up to former years and a good crop is promised. Early market-garden crops are backward, with prices about normal; prospect improving for later ones. Quantity and price of dairy products fully up to the average, if not a trifle better; dairy cows are scarce, with good prices offered. Pastures have improved considerably with the recent heavy rains. Apples have set well and will be a good crop; pears not up to the usual average; all berries promise big yields. There was a heavy hailstorm the 21st, with much rain, which was needed.

Dighton (J. N. PAUL). — Cut worms and potato bugs are doing some damage. Corn did not come up well and is not looking well; acreage about as usual. Haying has not commenced, but the crop promises to be very good. Acreage of early potatoes increased and crop promises well. Yield of early market-garden crops better than last year, but prices lower. Supply and price of dairy prod-

ucts about as usual ; cows lower. Pastures are in good condition. Apples and pears promise well ; peaches winterkilled ; strawberries a small crop and badly winterkilled.

Swansea (F. G. ARNOLD). — Tent caterpillars and potato bugs are doing some damage. Acreage of Indian corn larger than usual, but it is looking poorly, with a poor stand, owing to cold, wet weather. No haying yet, but prospect of an average crop. Acreage planted to early potatoes about as usual, but many fields failed to come up and the land has been planted to corn. Milk plenty, price same as last year ; cows about the same price as last year. Pastures have been very good, but now begin to show the effects of dry weather. Pears, plums and apples have set well ; no peaches ; strawberries are being marketed, some fields yielding well while others have blasted.

Dartmouth (L. T. DAVIS). — Squash and potato bugs are doing some damage. Indian corn is very backward, but should improve with warmer weather. Haying has not begun and the crop will not be as good as expected. Not much change in acreage of early potatoes, and they are not far enough advanced to indicate the probable crop. Quantity of dairy products well up, and prices a little higher than some years ; dairy cows very high. Pasturage does not fulfil the early promise. Fruits have not set very well, but small fruits have set better and currants and raspberries promise well.

Acushnet (M. S. DOUGLAS). — Cut worms and potato bugs are doing some damage. Indian corn is looking rather poorly, with about the usual acreage. Haying has not yet begun, but there will be a very large crop this year. The acreage of potatoes is increased one-fourth and they now promise well. Yield of early market-garden crops equal to former years, average prices, and prospect good for later ones. Dairy products are more than average in quantity, with prices same as usual. Pasturage is in excellent condition. No peaches ; pears half a crop ; fine crop early apples, late apples half a crop ; plums good ; grapes fair ; strawberries a large crop ; raspberries good where not winterkilled. Squash, corn, melon, and cucumber seeds have not germinated well.

PLYMOUTH COUNTY.

Norwell (HENRY A. TURNER). — Tent caterpillars are doing some damage. Indian corn is not looking very well, and not much is planted in this locality. A few have begun haying and the crop will be good. There is a larger acreage of early potatoes than usual and they promise well. Dairy products are about as usual

in quantity and price. Pastures are in very good condition. The outlook is good for strawberries, blueberries and currants.

Duxbury (R. T. RANDALL). — Cut worms, tent caterpillars and potato bugs are doing some damage, but not as much as usual. Corn looked well before the rain and hailstorm of the 21st; acreage larger than usual. Early potatoes are blooming, but were damaged by the storm. Early market-garden crops are later than usual but look well. Quantity and price of dairy products and supply and price of dairy cows about the same as usual. Pasturage never looked better than now. Strawberries look well. Frost damaged cranberries in some localities.

Halifax (G. W. HAYWARD). — Onion maggots and potato bugs are doing some damage. Corn is very uneven and small, and the acreage is less than usual; many fields had to be planted over. Not much haying done as yet, but there is promise of a good crop. Rather more early potatoes are planted than usual and they are looking very good. There is rather more milk than usual, with prices lower; cows tend lower in price than last year. What pasturage we have is in the best condition. Strawberries, blackberries, raspberries and all wild berries are yielding or promising to yield large quantities of excellent fruit.

Kingston (GEO. L. CHURCHILL). — Indian corn is rather backward as compared with former years, but with the usual acreage. Haying has not commenced as yet. The acreage of early potatoes is increased and they promise to give a very good crop. The prospect is very good for market-garden crops. Dairy products are about as usual in quantity and price, as are also dairy cows in supply and price. Pastures are more than up to the standard. Apples are looking well; pears fair.

Lakeville (N. G. STAPLES). — Potato bugs are doing some damage. Corn is beginning to look well, with about the usual acreage. Haying has not begun, but a large crop is promised. The acreage of early potatoes is increased about one-eighth, and there is prospect of a good crop. Early market-garden crops have yielded better than last year, with prices about the same. The quantity and price of dairy products and the supply and price of dairy cows are about normal. Pastures are in fairly good condition. Strawberries are not up to the usual yield, but are bringing a little higher prices.

Rochester (Geo. H. RANDALL). — Cut worms, tomato fleas and potato bugs are doing some damage. Indian corn was planted late and is small, but looks thrifty; acreage probably less than on previous years. Some early grass is cut and the hay crop is much better than for several years. Early potatoes look well and healthy,

but many fields were planted so late that they are still very small. Early market-garden crops are very good in both yield and price. Quantity and price of dairy products both very good; prices of dairy cows above the average. Pasturage is in very good condition. Strawberries are doing well, but some have suffered from cold weather, prices generally good; raspberries look well. A severe hail storm the 22d did much damage to vegetation.

Mattapoisett (E. C. STETSON). — Insects are very scarce, only a few potato bugs and currant worms. Corn is looking quite well but is late; acreage about as usual. Haying has not begun, but the prospect for the crop is extra good. The acreage of early potatoes is slightly increased and the promise for the crop is good. Early market-garden crops are about as usual in yield and price. There is not much difference from former years in the quantity and price of dairy products, but dairy cows are cheaper. Pasturage is in good condition. Strawberries and currants are giving extra good yields.

BARNSTABLE COUNTY.

Falmouth (D. R. WICKS). — Insects as a whole are not doing much damage. Corn is backward, with about the usual acreage. Very little hay has been cut as yet and is now just in bloom, with a great growth. The acreage of early potatoes is perhaps slightly increased and the early planted now look finely. Early market-garden crops are about the same in yield and price as formerly. Pastures are in fine condition, with plenty of feed. Strawberries are a fine crop; blackberries very promising; raspberries winter-killed somewhat, but otherwise good; some varieties of currants loaded, while others show but half a crop; English gooseberries a fair crop; apples plenty; Japanese plums good; peaches promise a two-thirds crop; pears the same or better.

Sandwich (R. F. ARMSTRONG). — Cut worms and potato bugs are doing some damage. There is an average acreage of Indian corn, but it is backward in growth. Haying has not begun as yet, but grass lands are looking well. There is a larger acreage of potatoes than usual, with vines looking well. Market-garden crops compare very favorably with former years and the prospect is good for later ones. Dairy products remain the same as usual in price, but cows are high. Pasturage is in good condition, in fact better than for ten years. Strawberries, raspberries and currants promise average crops, while apples, pears and plums seem to be average; peaches are in doubt, owing to leaf curl affecting the trees.

Barnstable (JOHN BURSLEY). — Tent caterpillars and cut worms are doing some damage. Indian corn is very small and backward,

but with acreage slightly increased. Haying has begun, with a full average crop, much in excess of 1902 and 1903. Acreage of early potatoes slightly increased, but they are backward. There is no change from the past three years in the quantity and price of dairy products or the supply and price of dairy cows. Pasturage is in fair to good condition. Strawberries good, cranberries looking well where not hurt by frosts or hail. A hail storm on the 22d destroyed potatoes, rye and gardens, and injured corn badly in a limited area about this section, destroying all prospect of a crop on some cranberry bogs.

Dennis (JOSHUA CROWELL). — Insects are not very plentiful thus far this season. Indian corn is looking well although rather backward; acreage increased somewhat. Haying has just begun, prospect for a full crop better than for several years. Acreage of early potatoes about average and the crop promises well. Early garden crops are not as good as usual, prices higher. Quantity and price of dairy products about average. Pastures are in very good condition. Strawberries are rather a small crop, owing to the cool season; cranberries look fairly well, but are not yet in blossom.

Chatham (E. Z. RYDER). — No insects are doing any damage of consequence. Indian corn is looking very well; acreage about the same as usual. Haying has begun and the prospect is for a large crop. The acreage of early potatoes is somewhat larger than usual with the promise of a good crop. Early market-garden crops are somewhat backward, with prices good. Quantity and quality of dairy products about as usual; prices somewhat better. Pasturage is in better condition than for several years. Strawberry crop short; good berries less than usual; currants average; grapes promise well.

Eastham (J. A. CLARK). — Insects are doing no particular damage. But little Indian corn is planted. But little hay has been cut, but the prospect for the crop is good. The acreage of early potatoes is greater than usual and they are looking well. No market-garden crops for market, with the exception of asparagus. Asparagus crop in excess of last year, prices not so good, making results about the same. Quantity and price of dairy products about the same as usual. Pastures are in good condition. There is a fair prospect for fruit, but little is raised for market.

DUKES COUNTY.

West Tisbury (GEO. HUNT LUCE). — Tent caterpillars and potato bugs are doing some damage. Indian corn is rather backward, with an average acreage. Haying has not begun, but the prospect

for the crop is good. There is an average acreage of early potatoes and they now promise well. The quantity and price of dairy products and the supply and price of dairy cows are about the same as usual. Pastures are in good condition. The outlook for strawberries is good.

NANTUCKET COUNTY.

Nantucket (H. G. WORTH). — Cut worms are doing some damage. Indian corn is poor and backward, with about the usual acreage. Haying has begun and there will be a good crop. There is about the usual acreage of early potatoes and the prospect for the crop is good. Early market-garden crops are about the same as usual in yield and price and later ones promise well. Quantity and price of dairy products and supply and price of dairy cows normal. Pasturage is in good condition. Strawberries are a good crop and blueberries promise well.

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THE GROWING OF MUSHROOMS.

By Dr. GEO. E. STONE, *Professor of Botany, Massachusetts Agricultural College.*

During the past decade considerable increased interest has been manifested in edible mushrooms of all kinds. Numerous publications, some of which are extensive and profusely illustrated volumes, have made their appearance, and in recent years mycological societies have been established in many localities. The members of these societies are enthusiastic in studying mushrooms, and, as a consequence of a large amount of diligent study, together with the testing of various types of edible species, a vast amount of information has been secured on this subject.

There is also an increased interest pertaining to the growing of mushrooms for the market, especially existing among amateurs and those who wish to indulge in some form of gardening on a small scale.

It is the purpose of this article to present in a brief manner an account of mushroom growing.

WHAT MUSHROOMS ARE.

Mushrooms are low, humble plants, belonging to the large group collectively known as fungi. Fungi are white plants, and are not infrequently called colorless, since they contain no green coloring matter such as is characteristic of leaves. On account of the absence of green coloring matter, or chlorophyll, they are incapable of decomposing the carbon dioxide of the air and building up compounds of starch, sugar, etc., which constitutes one of the chief characteristics of green plants.

Mushrooms are what botanists term "Saprophytes," that is, they obtain their food from decomposed organic matter contained in the soil. They do not propagate by seeds, as the higher plants do, but have instead numerous microscopic spores, which possess a similar function to seeds, but are much more simple in their make-up. On this account mushroom spores do not possess the same chance for reproduction of the individual as seeds, hence the necessity for spores to be reproduced

in enormous quantities, in order that a few may be fortunate enough to alight in some favorable situation suitable for germination and the reproduction of the individual. The spores are borne on the so-called

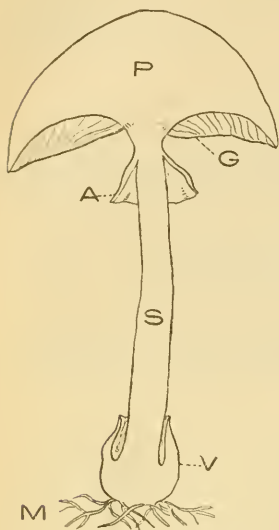


FIG. 1. — Longitudinal section of a mushroom; poisonous species of *Amanita*. *P*, pileus; *G*, gills or lamellæ, on which the spores are borne; *S*, stipe or stem; *A*, annulus or ring; *V*, volva; *M*, mycelium.

gills, located under the head, or umbrella-like shaped cap, which is termed technically the pileus. The mushroom that is gathered for market constitutes the fruiting portion of the plant. The other portion of the plant is comparatively insignificant, and is represented by the white thread-like growth or Mycellium which permeates the soil.

The so-called mushroom spawn is composed of these threads or root-like filaments, composted with manure and pressed into bricks. Much of the spawn or bricks sold in the markets comes from England or France, and frequently fails to spawn when planted under favorable conditions. The English spawn is sold in the form of bricks which weigh about one and one-fourth pounds, while the French spawn is composed of flakes or loose material. Spawn is sold by all of the leading seedsmen. In sowing the spawn the bricks are broken up into numerous small pieces and planted. The larger the amount of live spawn contained in the bricks the better is the product. Occasionally attempts have been made to utilize home-made spawn, but practically all of this material used is imported.

Mushrooms do not constitute an especially easy crop to grow, or at

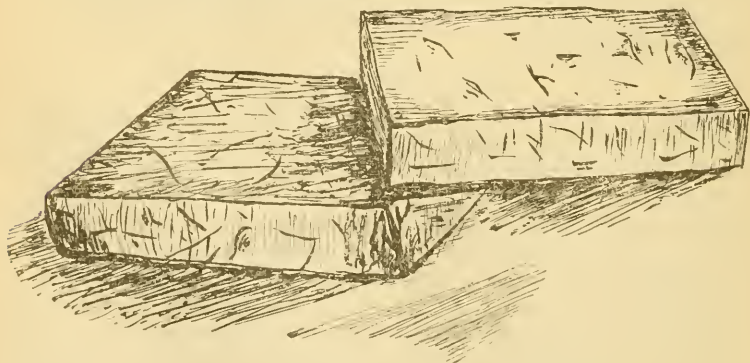


FIG. 2. — Spawn mixed with manure and pressed into bricks.

least success has not always been obtained by those who have attempted to grow them. One of the chief difficulties appears to lie in poor spawn, and undoubtedly proper temperature and soil conditions have not always been maintained.

During the past two years the Bureau of Plant Industry at Washington has attempted to improve the quality of spawn and methods of growing mushrooms. It is anticipated that the results of this work will appear subsequently in a special publication, and it is expected that much valuable information resulting from research upon this subject will be available and will materially assist mushroom growers in their business.

HOW MUSHROOMS ARE GROWN.

The common mushroom of the market (*Agaricus Campestris*) grows almost everywhere out of doors. It is readily detected by those familiar with mushrooms, and especially by foreigners who have spent their early life in Europe, where considerable more attention is given to edible fungi than in America. It is a matter of common observation in summer to see Italians gathering various edible mushrooms in pastures. Mushrooms frequently come up by themselves in greenhouses under the benches where manure and potted soil is stored. We have gathered frequently many specimens thriving in such localities. When mushrooms are grown for the market on a commercial basis it is essential that all of the conditions be made as desirable as possible for their growth and development, in order that a large and profitable crop may be obtained. It is necessary that a uniform degree of temperature be maintained, and that the crops be secluded from drafts and sunshine.

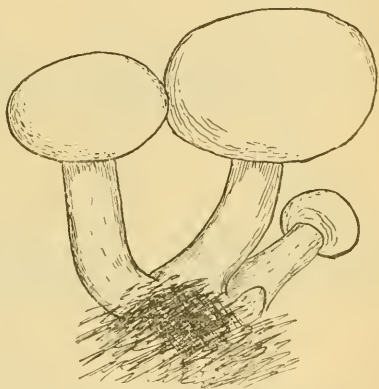


FIG. 3. — A group of mushrooms (*Agaricus Campestris*).

Total darkness, however, is not absolutely necessary, since mushrooms grow well in diffuse light. Uniform temperature and moisture conditions are more likely to exist in dark places, and it is for this reason that mushrooms are grown in the dark. Those who grow mushrooms commercially make use of cellars, barns, sheds, tunnels and space under greenhouse benches, etc., as well as in specially constructed mushroom houses. It is desirable, however, to have a tolerably dry foundation for a mushroom bed. The conditions of a cellar can be made suitable for mushroom growing, especially for amateurs who wish to go into the business on a small scale. By partitioning off a portion of the cellar and closing up the windows, more constant and uniform conditions can be obtained. Space under greenhouse benches can be made especially suited to mushroom culture, and many growers take advantage of this space for their propagation.

CONDITIONS ADAPTED TO MUSHROOM GROWING.

Soil.—The most suitable soil conditions for mushroom culture consists in supplying the beds with plenty of good horse manure, mixed

with loam or decomposed sod, mixing about one-fourth or one-fifth loam or decomposed sod with manure. Either fresh or partially rotted manure can be used, and this should repeatedly be well worked over, composted and watered frequently, taking care that it does not burn. After it has been well worked over and composted various times, and the heat is not likely to rise above 130° F, it should be thoroughly incorporated with one-fourth to one-fifth decomposed loam or sod. It can remain in this condition until ready for use. The beds are usually made up ten to fourteen inches deep, and in these are placed the soil and manure for growing them. The bottom of the bed should be supplied with six inches of fresh manure, well tamped down. It should be covered with the prepared manure and loam mentioned above, adding about two inches at a time, and compacting the same. If it shows a tendency to heat too much, incorporate a little loam with it. One or two

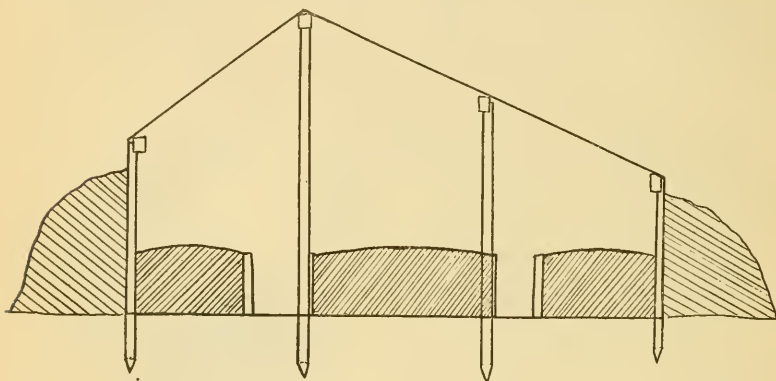


FIG. 4.—Cross-section of a wooden mushroom house about sixteen feet wide; provided with beds. The house is banked up with earth, and the earth is covered with salt marsh hay, heated from boiler.

layers two inches deep of the prepared loam and manure can be put on each day until the required depth is obtained. Straw or some mulching material is then put over the top of the bed until ready to spawn. This answers the purpose of catching the condensed steam and keeping the surface from getting too wet. After the temperature of the beds has reached about 90° to 95° F. the straw should be removed and the bed spawned, although some growers prefer a temperature of about 80° F. This is accomplished by breaking the bricks into pieces and planting the pieces in rows in the bed. The rows should be about one foot apart, and the pieces of spawn inserted every six or eight inches and covered up superficially with the soil. When spawning is completed, compact the surface of the bed all over. After this is accomplished the bed can again be covered with straw, and in the course of eight or nine days the straw is removed and the bed covered with two inches of good, mellow loam. Care should be taken that the temperature of the bed does not exceed 80° F. after covering, as in that case one is likely to lose the crop.

Temperature and moisture.—Before the mushrooms have made their

appearance through the loam, a temperature of from 65° to 75° F. may be obtained; but after the mushrooms have commenced to develop, the temperature should be kept about 55° F. If the temperature goes above 60° F., some means should be employed to lower it; and if it goes below

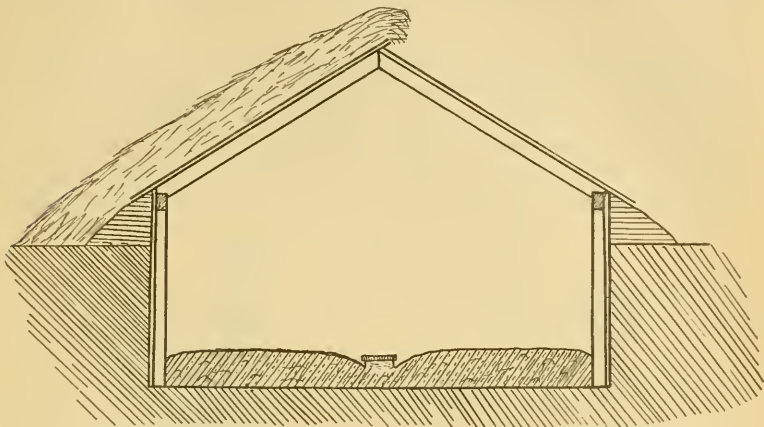


FIG. 5. — Cross-section of a mushroom house. The house is constructed of wood and banked up with earth, and the earth covered with hay or straw.

50° F., it should be raised either by covering the beds or by applying artificial heat. Beds should never be allowed to become too dry, and must be kept tolerably moist, either by employing matting or old carpets before the mushrooms appear, or by sprinkling with water.

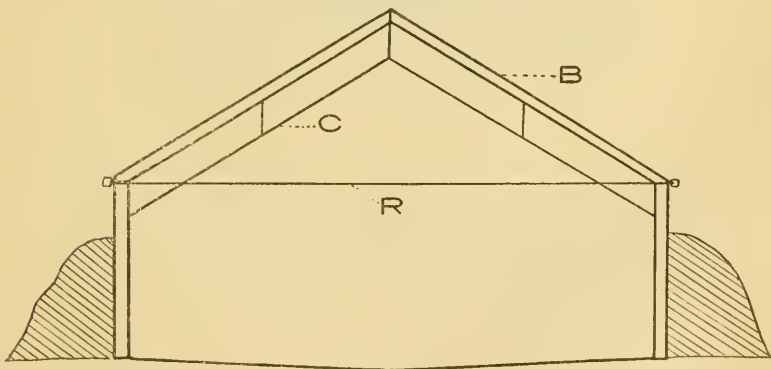


FIG. 6. — Cross-section of a cement and corrugated-iron mushroom house, banked up with earth. The house is provided with a truss roof. *C*, corrugated iron; *B*, wooden truss; *R*, half-inch iron tie rod. The house is fifteen feet wide, and four feet high at ends to iron roof, and is heated from boiler.

Houses. — Where special attention is given to commercial mushroom growing, houses are constructed which are adapted to the growth of this crop. The style of houses shown in figs. 4 and 5 represent types that have been utilized for some time by various commercial growers of mushrooms. The houses usually set two or three feet below the level

of the ground, and dirt is piled up on either side to the level of the plates which support the roof. These types of houses have usually been built of wood, and the roof is covered with hay or marsh grass. The beds are either built on the ground or slightly raised. In the latter case they are provided with board sides, thus leaving room for a path, as shown in fig. 4. Some improvement has been made in recent years in the style of houses for mushroom culture. One of the principal objections to houses such as shown in figs. 4 and 5 is that they are very likely to rot out quickly, and it is expensive to renew them. An experienced mushroom grower informed me that such a house would only last about three years. On account of the dampness arising from the heat of the manure and the unfavorable situation of material constructed

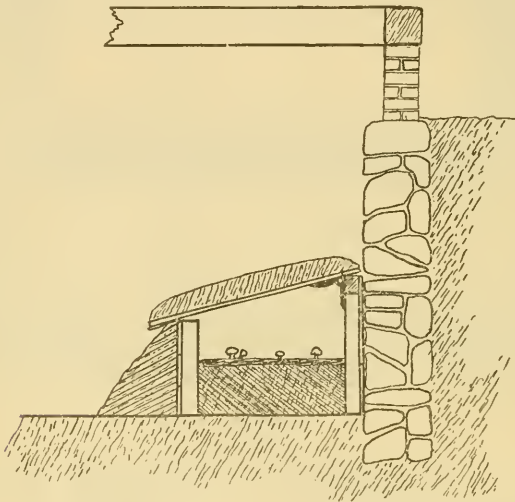


FIG. 7. — Section of a cellar bed covered with boards and matting and banked up with earth.

of wood, rotting occurs very quickly. The conditions in a mushroom house are exceedingly favorable for timber-destroying fungi, thus causing premature decay. The house shown in fig. 6 in a more recent model, used by Wyman Bros., market gardeners, Arlington, Mass. It is an even-span house, fifteen feet wide and about four feet high at the sides. The length of such a house is of course immaterial. The side walls are built of cement, and there is a truss roof constructed out of wood and corrugated iron. The corrugated iron roof and cement sides furnish construction material which will not readily decay; and, while a house of this description may cost more at the outset, it is far cheaper in the end for a commercial grower who intends to follow that line of work. Cellar benches can be constructed singly or in series, one or more above the ground bed. A single bed is shown in fig. 7. The construction of cellar beds would depend materially upon the space and the conditions available.

GATHERING THE CROP.

It is necessary with a crop like mushrooms, as it is with many others, to go over the beds each day and gather the mature specimens. These are gathered in trays, care being taken not to have them become soiled in handling.

In picking mushrooms it is recommended that they should not be cut off at the base, but gently twisted and removed from the soil. When it is necessary to cut, as is sometimes the case when they come up in large numbers, it is recommended that the butts be subsequently removed and the holes filled with soil, in order to prevent decay. Mushrooms can be kept in a cool, dark place for two or three days after picking, with little detriment.

PRICE OF MUSHROOMS.

Mushrooms, like other crops, are usually assorted into grades which bring different prices. The price of mushrooms usually varies from one season to another, and also during the same season. A No. 1 product will bring \$1 per pound during certain seasons, while at other seasons they will sell from 25 cents to 50 cents per pound. During the past winter mushrooms were as low as 25 cents per pound at one time in the Boston market.

DISEASES OF MUSHROOMS.

There are a few troubles caused by fungi, insects, etc., which occasionally give rise to loss of mushrooms. Among some of the troubles experienced the following may be mentioned. Dark-colored spots coming on the cap of the mushroom, which induce decay and render them unfit for the market. These are caused by eel worms, which are minute microscopic worms similar to those frequently giving trouble to tomatoes, cucumbers and various other plants. Various animals, such as maggots, wood lice and sow bugs, occasionally give rise to trouble, and there are certain rots caused by fungous growths which sometimes damage the crop.

On account of very little attention having been given to the diseases of mushrooms, no definite specific remedies have been suggested for many of these troubles. No doubt there are, however, cultural methods which could be applied that would prove of some value in exterminating or controlling the ravages of these various organisms.

MASSACHUSETTS
CROP REPORT

FOR THE

MONTH OF JULY, 1904.

GYPSY AND BROWN-TAIL MOTHS.

*ISSUED MONTHLY, MAY TO OCTOBER, BY STATE BOARD OF
AGRICULTURE, STATE HOUSE, BOSTON, MASS.*

J. LEWIS ELLSWORTH, Secretary.

ENTERED JUNE 3, 1904, AT BOSTON, MASS., AS SECOND-CLASS
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CROP REPORT FOR THE MONTH OF JULY, 1904.

OFFICE OF STATE BOARD OF AGRICULTURE,
BOSTON, MASS., Aug. 1, 1904.

Bulletin No. 3, Crop Report for the month of July, is herewith presented. Attention is called to the article at the close of the report on "The Gypsy and Brown-tail Moths," by A. H. Kirkland, M.S., formerly assistant entomologist to this Board, and, at the close of the work against the gypsy moth, acting field director. These pests have secured such a foothold in this Commonwealth, and are spread over so wide an area, that many requests for instruction as to their life history, habits and the means of destroying them have been received at this office. We have an excellent report on the brown-tail moth, giving full details on these points, but nothing on the gypsy moth giving methods of combating it, so it has been thought best to put out this information through the agency of the Crop Report. Mr. Kirkland has been in close touch with the conditions in the infested territory since the gypsy moth work of this Board came to an end, and for that reason is in a position to give more information in regard to these particular pests than any other person.

PROGRESS OF THE SEASON.

Preliminary returns to the Chief of the Bureau of Statistics of the United States Department of Agriculture (Crop Reporter for July, 1904) show the acreage of corn planted to be about 91,930,000 acres, an increase of about 2,130,000 acres, or 2.4 per cent, on the area planted last year, as revised in December. The average condition of the growing crop July 1 was 86.4, as compared with 79.4 on July 1, 1903, 87.5 at the corresponding date in 1902, and a ten-year average of 88.4.

The average condition of winter wheat was 78.7, as compared with 77.7 a month earlier, 78.8 in 1903, 77 at the corresponding date in 1902, and a ten-year average of 78.3. The average condition of spring wheat was 93.7, as compared with 93.4 last month, 82.5 in 1903, 92.4 in 1902, and a ten-year average of 86.8. The average condition on July 1 of spring and winter wheat combined was 84.5, as compared with 80 on July 1, 1903, and 82.9 at the corresponding date in 1902. The amount of wheat remaining in the hands of farmers at that date was estimated to be about 36,630,000 bushels, equivalent to about 5.7 per cent of the last crop.

The average condition of the oat crop on July 1 was 89.8, as compared with 89.2 a month earlier, 84.3 in 1903, 92.1 in 1902, and a ten-year average of 87.3.

The average condition of barley was 88.5, against 90.5 a month earlier, 86.8 on July 1, 1903, 93.7 in 1902, and a ten-year average of 87.1.

The average condition of winter rye on July 1 was 88, as compared with 90.2 on July 1, 1903, 91.2 at the corresponding date in 1902, and a ten-year average of 89.7. The average condition of spring rye was 90.8, as compared with 88.3 on July 1, 1903, 89.3 at the corresponding date in 1902, and a ten-year average of 87.4.

The acreage of flax is less than that of last year by about 826,000 acres, or 25.6 per cent, and the condition on July 1 was 86.6.

The average condition of rice on July 1 was 88.2, against 94.9 a month earlier and 93.5 a year ago.

The acreage of potatoes, excluding sweet potatoes, is greater than that of last year by about 99,000 acres, or 3.4 per cent. The average condition July 1 was 93.9, as compared with 88.1 in 1903, 92.9 at the corresponding date in 1902, and a ten-year average of 92.

The acreage of tobacco is less than that of last year by about 231,000, or 22.3 per cent. The average condition on July 1 was 85.3, against 85.1 a year ago.

TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM UNITED STATES CLIMATE AND CROP BULLETINS.]

Week ending July 4. — With the exception of portions of the South Atlantic and east Gulf States, the week was cooler than usual in all districts east of the Rocky Mountains, and also over the southern Plateau region and the greater part of California. In the central valleys and over portions of the Lake region, Middle Atlantic States and New England the week averaged decidedly cool, the temperature deficiencies ranging from 6° to 9° a day. On the north Pacific coast the week averaged warmer than usual. Over the greater part of the Lake region, Atlantic coast and west Gulf districts the rainfall exceeded the average, from 1 to more than 3 inches being generally reported from these districts. There was less than the average over the greater part of the central valleys, over a considerable area of the east Gulf States and along the immediate coast from North Carolina to southern New England.

Week ending July 11. — In the States bordering on the Atlantic the week averaged slightly warmer than usual. Over the western part of the Lake region and from the upper Mississippi valley westward to the middle and south Pacific coasts the week was cooler than usual. The temperature was slightly below normal in the central Gulf States and nearly normal in the lower Lake region and Ohio valley. The rainfall during the week was largely in excess of the average from the central and west Gulf coasts northward to Minnesota and South Dakota. There was also more than the average rainfall generally through the Middle Atlantic States and over portions of the Lake region, Ohio valley and South Atlantic States. In New England and in portions of the upper Lake region, Ohio valley, South Atlantic States and east Gulf States the rainfall was below the average.

Week ending July 18. — The week was decidedly cool in the Pacific coast States and Plateau regions, but elsewhere there were no very marked departures from normal conditions. There was a general but slight excess over the eastern slope

of the Rocky Mountains, in the Missouri and upper Mississippi valleys, and over portions of the Lake region and southern New England, while from the Ohio valley southward to the Gulf and Atlantic coasts, in northern New England and along the west Gulf coast the temperature averaged slightly below normal. From the central Gulf coast northward to the Lake region, over portions of the Middle and South Atlantic States, in the Red River of the North valley and on the north Pacific coast the rainfall was in excess of the average, while from the west Gulf coast northward to the Missouri valley, over the northern portion of the Lake region, in the upper Ohio valley and in portions of New England and the Middle Atlantic States the rainfall was below the average.

Week ending July 25. — Over the greater part of the country east of the Mississippi the temperature differed but slightly from the normal, some stations showing a slight excess and others a corresponding deficiency. In the central Gulf districts and from the west Gulf coast and Rio Grande valley northward to the upper Lake region and upper Mississippi and Red River of the North valleys the week averaged cooler than usual. Heavy rains fell in the west Gulf States, the central Missouri valley, on the Atlantic coast from New Jersey southward to the Carolinas, and over local areas in the east Gulf States, lower Ohio valley and Lake region. Over most of the central valleys, a large part of the Lake region, northern New England and on the north Pacific coast the rainfall was below the average, a considerable part of the central Mississippi and Ohio valley receiving no appreciable amount.

SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

Week ending July 4. — New England. Boston : Weather very favorable for rapid growth of all crops, but rain delayed haying ; onions much damaged by maggot ; corn late but much improved ; other crops very promising ; potato bugs and cut worms abundant, but doing no great damage.

Week ending July 11. — New England. Boston : Weather very favorable : showers, however, delayed haying in south ;

all crops made good growth; corn much improved and near average; potatoes and tomatoes excellent, other vegetables good, except onions; apples set full and growing rapidly, but dropping in some sections: pears and plums below average and dropping; other fruits and all berries very good; tobacco good and growing well.

Week ending July 18. — New England. Boston: Weather favorable for crop growth and fairly good for hay harvesting; rain needed in Maine and Vermont and would be beneficial in all sections; potatoes and other vegetables and grain good crops; apples dropping badly, but promise good crop; all berries fairly good, other fruits uneven: tobacco satisfactory, some has received last hoeing.

Week ending July 25. — New England. Boston: Weather very favorable for harvesting and fairly good for growing crops: rain needed in north; potatoes promise large yield, other vegetables very good except onions, which are much below average: corn very promising, but suffering for moisture in some northern sections; rye and oats good and being harvested: apples good crop, though some dropping; berries plentiful: other fruit uneven: tobacco excellent, being topped.

WEATHER OF JULY, 1904.

The weather of the month was notable for conditions near the seasonal in the several elements of precipitation, temperature and sunshine. The precipitation, while considerably below the normal, was so well distributed through the period and over the territory that the deficiency was hardly noticeable and not sufficient to retard crops. The showery periods were interspersed with several days of sunshine, which afforded excellent conditions for hay making. Generally speaking, thunderstorms were less frequent than usual for July, although in some sections they were unusually violent, being attended by heavy squalls and hail, with vivid lightning which in a good number of instances resulted in loss of life, shocks and injury to numerous persons, fires in buildings and loss of stock. The temperature was rather remarkable for equable distribution and a uniformly high range of the maxima and the minima, with an absence of

extremes in both. Some quite warm weather was experienced in the inner sections of the State, the temperature ranging in the 90s on several days; but in coast sections the maximum, according to official figures, did not reach 90 degrees. There were, however, several days during which the moisture was excessive, and this, combined with the very light winds, caused muggy, oppressive weather. The weather very favorable to growth of crops and to farm operations. Viewed as a whole, July was a very pleasant month.

In the circular to correspondents, returnable July 23, the following questions were asked:—

1. What insects are proving most troublesome in your locality?

2. What is the condition of Indian corn, and what proportion of the crop will be put into the silo?

3. What is the quantity and quality of the hay crop as compared with former years?

4. What forage crops are being raised to supplement the hay crop, for the silo and to eke out the pastures, and what is their condition?

5. What is the condition of market-garden crops, including potatoes, and how have those already harvested compared in yield and price with former years?

6. What is the prospect for apples, pears, peaches, plums, quinces, grapes and cranberries?

7. What is the condition of pasturage in your locality?

8. How have rye, oats and barley compared with former years, both as grain and forage crops?

Returns were received from 162 correspondents, and from them the following summary has been made:—

INSECTS.

It is not often that as little damage from insects is reported at this time of year as was indicated by the returns of our correspondents this month. Potato bugs are the insect most common, but are apparently much less injurious than usual. Other insects reported as doing damage are squash bugs, currant worms, onion maggots, cabbage root maggots, cabbage worms, tent caterpillars, elm leaf beetles, rose bugs,

gypsy moth caterpillars, brown-tail moths, plant lice, white grubs, cranberry vine worms, squash vine borers and the curculio.

INDIAN CORN.

Indian corn is reported as being still backward in some sections, but the warm weather of the month brought it forward very rapidly, and the prospect for the crop is now very promising. While the stand is not of the best, owing to poor germination of seed, the crop is of good color and otherwise thrifty. With normal weather during August an average crop of both grain and stover should be secured. The proportion of the crop used for ensilage varies in different localities, being greatest in the dairy regions of the central and western counties, but even in these counties some correspondents report that there are very few silos in their vicinity. Nevertheless, the use of ensilage appears to be gaining steadily if slowly in all sections.

THE HAY CROP.

At the time of making returns the hay crop was practically secured in all sections of the State. In quantity the crop exceeded expectations and was above the average, taken as a whole, while the quality was excellent and it was generally secured in good condition. The recent light rains will operate to give the second crop a good start, but more moisture will be needed soon for its development.

FORAGE CROPS.

The amount of forage crops planted was probably slightly less than usual, because of the good outlook for the hay crop and the good feed in pastures. Corn is the favorite, and is used both for the silo and to feed green, followed by the millets, oats, Hungarian grass and barley, in the order named. Other forage crops reported are oats and peas, oats and barley, peas, rye, soy beans, beets and turnips. Oats and peas appears to be a combination that is gaining in popularity. Corn is well up to the normal in point of growth as a forage crop, and the others are also reported to be in good condition.

MARKET-GARDEN CROPS.

Market-garden crops are generally in prime condition and unusually good yields are reported for those already harvested. Prices on the other hand are at a lower level than usual, but, taken with the good crops secured, not too low for profit.

EARLY POTATOES.

At the time of making returns very few early potatoes had been dug, but a fine growth of vines was reported and excellent promise for the crop when mature. Prices have been good, so far as noted, but cannot be considered as established for the crop of the year.

FRUITS.

It is perhaps too early to make a definite forecast as to the apple crop, but present indications are that the crop will not be up to the average of a bearing year for the State as a whole. The midsummer drop is reported as severe in some sections, while others report poor setting of the fruit, particularly for winter varieties. On the other hand, numerous correspondents report that a good crop is in prospect. Pears are uneven and a light crop is in prospect. Plums are also reported as uneven and hardly up to the average, taken as a whole. Peaches will give a good yield in some sections, but are generally a light crop. Grapes promise a good yield at present. Cranberries suffered from late frosts and from hail, and the crop will be much below average in the section of commercial production.

PASTURAGE.

Feed in pastures has been good through the season, but at the time of making returns was reported as becoming short and dry in some sections, because of the hot weather. The rains of the last few days should correct this condition, at least temporarily.

SMALL GRAINS.

Rye, oats and barley are reported to be unusually good crops, both for grain and forage, having headed out well and produced a fine growth of stalk, and have been largely secured in good condition.

NOTES OF CORRESPONDENTS.

(Returned to us July 23.)

BERKSHIRE COUNTY.

New Marlborough (E. W. RHOADES). — Insects are not as troublesome as in former years. Corn is growing well; not much of the crop used for ensilage. The hay crop was average in quantity and of very good quality. Corn and millet are the principal forage crops and are growing very fast. Early potatoes are a little late but promise well. There is prospect of large yields of apples and plums; other fruits not so good. Pastures are holding out remarkably well. Full yields of rye, oats and barley are being harvested.

West Stockbridge (J. S. MOORE). — Currant worms and potato bugs are the only insects guarded against, though we have a few elm leaf beetles. What corn came up is looking finely; not a silo in town. The hay crop is heavier than last year and is being harvested in much better condition. No forage crops have been raised, as pastures are in good condition. No potatoes have been dug, but there is every promise of a good crop. There will be a fair apple crop; few pears; no peaches, quinces or cranberries; very few grapes. Rye, oats and barley have done well.

Tyringham (E. H. SLATER). — The potato bugs have not been as troublesome this year as in previous years. Indian corn is somewhat backward; about one-fourth of the crop will be put into the silo. Japanese millet is raised to some extent to eke out the pastures, and corn is raised to supplement the hay crop and for the silo. Potatoes are looking well, but very few have been dug as yet. There will be a good crop of apples. Feed is holding out well in the pastures. Oats and barley compare favorably with former years, both as grain and forage crops.

Lee (ALONZO BRADLEY). — Potato bugs are our most troublesome insect. Indian corn is looking well but is two weeks late; 10 per cent of the crop will go into the silo. Grass as a whole was not quite an average crop, but the quality was excellent. Potatoes promise a large crop. The apple crop is somewhat doubtful, but promises fairly well. Pastures are in good condi-

tion. Rye, oats and barley are full crops, both as grain and forage.

Washington (E. H. EAMES). — Insects are causing little trouble. Indian corn is the best for three years; one-fourth of the crop will go into the silo. Quality of the hay crop good and quantity about three-fourths of a full crop. Forage crops are not raised. Potatoes promise well; no market-garden crops raised. Apples promise a good crop; other fruits not raised. Pastures were never in better condition. Rye, oats and barley are in good condition and compare well with former years.

Peru (F. G. CREAMER). — Potato bugs are doing some damage. Indian corn is in fair condition; three-fourths of the crop will go into the silo. Hay is a light crop. Oats are the principal forage crop grown here. Nearly all garden crops look well and potatoes never looked better. The prospect is good for apples, pears, plums and quinces. Pastures are in fair condition. Rye, oats and barley are good crops, both for grain and forage.

Cheshire (L. J. NORTHUP). — Insects are not doing any particular injury. Indian corn although late has made rapid progress in the past ten days. The hay crop will not be up to the normal on old meadows. Corn, millet and oats are the principal forage crops grown. Market-garden crops are yielding well and prices are well sustained. Apples promise a fair yield; plums and pears not plenty. Pasturage is short but is in fair condition. The grain crops, more especially oats, are good.

New Ashford (ELIHU INGRAHAM). — Potato bugs are doing some damage. Indian corn is in fine condition; one-tenth of the crop will be used for ensilage. There is a fine hay crop of excellent quality. Forage crops are not raised. Potatoes look finely, but none have been harvested as yet. There is a fair crop of apples; other fruits not grown. Pasturage is in fair condition.

Savoy (W. W. BURNETT). — There is very little damage from insects, potato bugs being the only ones present. Nearly the entire corn crop will go into the silo, as it seems impossible for it to mature. The hay crop is less than the average in quantity and of fair quality. Corn is the principal forage crop grown. Garden crops are backward; potatoes look finely but are not ready to dig. Fruit of all kinds is not up to the average. Pasturage is and has been better than average. Rye, oats and barley are about average crops, but are little raised.

FRANKLIN COUNTY.

Rowe (F. W. WOFFENDEN). — Potato bugs are causing some trouble. Corn is rather poor; about one-half the crop will be put into the silo. The hay crop is above the average both as to quan-

tity and quality. Oats, millet and sweet corn are the forage crops grown and are in fair condition. Market-garden crops, including potatoes, are in good condition, but little harvested as yet. Apples promise a good crop; small fruits about average, though not grown to any extent. Some pastures are getting short owing to dry weather. Rye, oats and barley are about average crops, but are little grown.

Colrain (A. A. SMITH). — Potato bugs and cabbage worms are doing some damage. Indian corn is in fine condition and half the crop will be used for ensilage. The hay crop is about normal in quantity and quality. Hungarian grass and the millets are the principal forage crops grown. Market-garden crops, including potatoes, are in good condition, and those already harvested have yielded well. The prospect is good for all kinds of fruits. Pasturage is in good condition. Rye, oats and barley are fully up to the normal.

Gill (F. F. STOUGHTON). — Potato bugs are doing some damage. Corn is of very good color; not more than one-fourth of the crop goes into the silo. Hay was a good average crop in quantity and quality. Corn is raised for ensilage and barley, oats and corn for soiling purposes. Potatoes promise well. There will be a large crop of apples. Pastures are in very good condition. Rye, oats and barley compare well with former years.

Deerfield (H. A. WELLS). — Potato bugs are the only insect doing damage and they but little. Indian corn is above the average; not over 350 tons of ensilage are put into the silo in this vicinity. Hay was a good average crop in both quantity and quality. Corn, oats and peas are the principal forage crops and are looking well. Potatoes promise an exceptionally good crop, but few dug, 50 cents a barrel cheaper than in former years. But little fruit is raised here, but there will be plenty for family use. Pasturage is in good condition. Rye and oats are heavily headed, but oats are lodging badly. Tobacco has made rapid growth. Many fields of onions not well stocked.

Whately (FRANK DICKINSON). — There are few insects of any kind. Corn is a week late; one-third of the crop goes into the silo. The quality of the hay crop is good and it is above average in quantity. Corn is the principal forage crop raised to supplement the hay crop. Potatoes promise a heavy crop; other market-garden crops normal. There will be less than an average crop of all kinds of fruit. Pasturage is in good condition. Rye, oats and barley are very little grown.

Sunderland (J. M. J. LEGATE). — Potato bugs are doing some damage. Corn is a little late but the hot weather is bringing it

forward rapidly; fully half the crop will be used for ensilage. Hay is more than an average crop in quantity and has been secured in fine condition. Corn and oats are the principal forage crops grown and they are looking finely. Early cabbages are a good crop, but prices have been much lower than last year. Potatoes are looking well and promise a heavy crop. Apples are a heavy crop, also plums; very few other fruits raised. Pastures could not be in better condition. Rye, oats and barley are little raised.

Northfield (T. R. CALLENDER). — There is very little complaint of insects, and potato bugs are less numerous than usual. Condition of Indian corn good; less than one-fourth of the crop used for ensilage. Hay is fully up to the average in quantity, being heavy on new seeded fields. Corn is the principal forage crop raised, with some oats and barley. All garden crops are in fine condition, potatoes especially so, but none dug as yet. Apples are uneven, some orchards being loaded with fruit and others bare. Pasturage is in prime condition. Rye winterkilled in places; other grains above average. Cucumbers for pickling give promise of the best crop for years. Crops are generally above the average.

Wendell (N. D. PLUMB). — Potato bugs are doing some damage. Indian corn is about a normal crop and half of it will be put into the silo. Haying is only about half completed, with a large yield. Corn, millet and Hungarian grass are the principal forage crops grown and all look well. Potatoes bring higher prices than in former years. There will be about half of a normal crop of fruit. Pastures are in good condition. Oats and rye are more than average crops.

HAMPSHIRE COUNTY.

Ware (J. H. FLETCHER). — Potato bugs are doing some damage. Indian corn is late with a smaller acreage than usual. The hay crop is very good on all land that is properly cared for. Corn, oats and Japanese millet are the forage crops grown, and they are looking well. Market-garden crops are in good condition, with prices about as usual. Apples promise a very good crop; other fruits little raised. Pastures are holding out well.

Greenwich (WM. L. DOUGLAS). — Potato bugs are doing some damage. Corn is in good condition; but little of the crop goes into the silo. Hay is more than an average crop of good quality. Corn is the principal forage crop grown. Garden crops are rather late. The prospect is good for fruit of all kinds. Pastures are suffering from lack of rain. Rye, oats and barley are full average crops.

Pelham (JOHN L. BREWER). — Potato bugs are doing some damage. Corn of all varieties is of excellent color and fair growth;

but little used for ensilage. Hay was a fair crop of excellent quality. Sweet corn, oats and barley are the principal forage crops and are looking nicely; late millet did not get a good catch. Potatoes have not yet been harvested. Apples, pears, plums and cranberries promise well; peaches a minus quantity. Pasturage is in excellent condition for the time of year. Most crops look finely, although some that were planted on wet land are uneven.

Belchertown (H. C. WEST). — Potato bugs are our most troublesome insect, but none are especially bad. Corn is growing fast now and bids fair to give a full average crop; perhaps one-fifth of it goes into the silo, not more. Corn, oats, millet and barley are the principal forage crops grown. Market-garden crops are somewhat late, but are coming on well now. Apples good, pears fair, no peaches, plums good, very few quinces, lots of grapes. Pasturage is in fair condition. Rye is above an average crop; oats and barley not yet harvested but promise full crops.

Hadley (H. C. RUSSELL). — Potato bugs are doing some damage. Indian corn is below the average in condition. Hay is about an average crop of good quality. Millet, Hungarian grass and corn are the principal forage crops raised. Garden crops are good with fair prices. There will be a heavy yield of pears; apples few; peaches none. Pastures are in good condition. Rye, oats and barley are average crops. Tobacco has made a good growth in the last three weeks and conditions are favorable for an excellent crop. Onions are doing well and the crop bids fair to be better than predictions earlier in the season.

Hatfield (THADDEUS GRAVES). — Potato bugs are doing some damage. There is fine promise of a good crop of corn; no silos in town. Hay is about five per cent above an average crop, of good quality. Forage crops are not raised, as there is little dairying here, tobacco being our principal crop. Potatoes promise a fine yield, although none have been dug for market. There will be small yields of most fruits. Pastures are getting a little dry. Rye, oats and barley are about average crops.

Easthampton (WM. E. CLAPP). — Indian corn is very backward, but is of good color. The hay crop is above the average in quantity and of good quality. Millet is the principal forage crop grown and looks well. Market-garden crops are backward, especially potatoes. The prospect for apples, plums and grapes is very good. Pasturage is in excellent condition. Rye is less than an average crop, but oats look well.

Goshen (ALVAN BARRUS). — Potato bugs are doing some damage, but are less troublesome than usual. Indian corn is late and four-fifths of the crop will probably go into the silo or be fed green.

Hay compares very favorably with former years in quantity and quality. Corn is the principal forage crop, but oats, barley and roots are raised to a limited extent. Potatoes are not yet fully matured for market; price 30 cents per peck. Apples abundant; otherwise a shortage of all fruits except grapes, which being late may not ripen well. Pasturage is in No. 1 condition. Less grain crops were planted than usual owing to the cold, wet spring.

Chesterfield (HORATIO BISBEE). — Potato bugs are present, but give no serious trouble. Corn is fairly good; perhaps one-third of the crop will be used for ensilage. There was an average hay crop of fair quality. Corn is the principal forage crop grown, with some oats and Hungarian grass. There will be a fair crop of apples: other fruit not much raised. Rye, oats and barley are good crops. Potatoes look finely.

HAMPDEN COUNTY.

Chester (C. Z. INZELL). — Indian corn is backward; about half the crop goes into the silo. Hay is not quite as heavy a crop as that of last year. Corn, oats and barley are the principal forage crops grown to supplement the hay crop and for the silo. Potatoes are looking well, but not many have been dug as yet. Apples promise to be a good crop. Pastures are in good condition.

Tolland (EUGENE M. MOORE). — Potato bugs are doing some damage. Where good seed was used the corn crop is about up to the average. There will be about the usual quantity of hay of good quality. Corn is the forage crop in this locality and is generally in fine condition. Potatoes are looking fine with a heavy growth of tops; not many dug as yet. Apples are dropping badly; there will be quite a quantity of grapes and cranberries this year. Pastures are in average condition. Rye is extra good and oats and barley above the average.

Granville (JOSEPH WELCH). — Potato bugs and tent caterpillars are doing some damage. Corn is looking very well; about 20 per cent of the crop used for ensilage. Hay is not more than a two-thirds crop, having winterkilled badly. Oats, barley and corn are the principal forage crops grown. Potatoes are looking finely, but are late, none having been dug as yet. The apple crop is better than last year, but will not be as large as that of 1902. Pastures are in very good condition. Rye, oats and barley are little raised for grain.

West Springfield (T. A. ROGERS). — Indian corn is looking well but is a little late; about one-third of the crop is grown for ensilage. Hay is a good crop as regards both quantity and quality. Corn, oats and peas, Hungarian grass and cow peas are the princi-

pal forage crops grown. Potatoes show a fine growth of tops, but none have been dug for market; market-garden crops look well. Apples, pears, plums and grapes will give full average crops; no peaches; but few quinces. Pasturage was good early in the season, but is a little short now. Rye and oats have done well.

Chicopee (R. W. BEMIS). — No insects are doing any damage this year. Indian corn is looking well. There is quite a good crop of hay this year. Corn and oats are the principal forage crops raised and they are looking well. Market-garden crops are looking well, as are also potatoes. Apples now promise a fair crop. Pasturage has been good, but is now in need of rain. Rye, oats and barley are about average crops.

Ludlow (CHAS. B. BENNETT). — Potato bugs are doing the most damage of any insect. Corn looks well but is late; about one-tenth of the crop is put into the silo. The hay crop is much larger than usual and of fine quality. Corn and the millets are the principal forage crops raised. Market-garden crops are about average and potatoes look excellently. Apples fair, pears light, peaches none, plums light and grapes fair. Pasturage is in very good condition.

Wilbraham (H. M. BLISS). — Indian corn is backward; one-fourth of the crop will be used for ensilage. Hay was an average crop of good quality. Hungarian grass and turnips are the principal crops grown for forage purposes. Market-garden crops are in good condition; potatoes are a good average crop and now bring \$1 per bushel. Apples promise a good yield; pears 40 per cent; no peaches or plums; quinces 20 per cent; grapes 95 per cent. Pasturage is in fair condition. Rye and oats are good crops.

Hampden (JOHN N. ISHAM). — There is comparatively little trouble from insects, and potato bugs are kept under control. Corn is growing rapidly, that replanted looking well; about a third of the crop will be used for ensilage. The hay crop is smaller than last year but of good quality. Corn is our principal forage crop, with some peas and oats, and both are in good condition. Garden crops good; growth of potatoes checked on dry land, prices good. Apples promise fairly well; pears and peaches light; plums heavy; quinces and grapes good. Pastures are short from lack of rain. Rye is less than an average crop, but oats made a good growth.

Palmer (O. P. ALLEN). — Insects are not as much in evidence as usual. Indian corn is in fair condition for a late season; not as much as formerly will be used in the silo. Hay is below the normal in quantity, but of good quality. Corn and rye are the principal forage crops raised. Market-garden crops, including

potatoes, are in good condition and those already harvested have brought good prices. All fruits promise well, except peaches. The recent dry weather has affected pasturage considerably. Rye, oats and barley are not quite up to the normal.

WORCESTER COUNTY.

Dudley (J. J. GILLES). — Squash bugs are doing some damage. Indian corn is in fair condition; three-fourths of the crop will go into the silo. There was an average hay crop in quantity and quality. Corn and millet are the principal forage crops grown. Market-garden crops are in average condition and prices have ruled high. There will be a full fruit crop. Pasturage is rather slim just at present. Rye, oats and barley are fair crops.

North Brookfield (JOHN H. LANE). — There are few insects of any kind at present. Corn is looking finely; three-fourths of the crop is used for ensilage. Hay was a three-fourths crop of good quality. Very few potatoes have been dug as yet. Apples 25 per cent of a full crop; pears 10 per cent; plums 20 per cent; grapes 100 per cent. Pastures are in good condition. Rye, oats and barley are late and little grain has been harvested.

Oakham (JESSE ALLEN). — Potato bugs are doing some damage. Indian corn looks very well; perhaps one-fourth of the crop will go into the silo. Hay is more than an average crop of excellent quality. Corn and Japanese millet are the principal forage crops grown. Potatoes look well. Apples, pears and grapes will be abundant. Pasturage is in excellent condition. Rye, oats and barley are full average crops.

Phillipston (A. D. CLIFFORD). — Cabbage root maggots and potato bugs are doing some damage. Indian corn is backward but is looking well; probably half the crop will be used for ensilage. The hay crop is a good average one both in quantity and quality. Corn for the silo, oats and Canada peas, also Hungarian grass for hay, are the principal forage crops grown, and are in good condition. Market-garden crops are in good condition, with fair prices so far; early potatoes show a fine growth of tops but a small yield of tubers. Apples promise a good crop; other fruits not much grown. Pasturage has been good, but is now in need of rain. Oats and barley are good crops, raised mostly for fodder.

Hubbardston (CHAS. C. COLBY). — Tent caterpillars, squash bugs and potato bugs are the insects doing the most damage. Corn is unusually backward but is making good growth; nearly all of it will be put into the silo. Hay is about an average crop with the quality above the average. We notice quite a large acreage of

forage crops, oats, Hungarian grass, millet and barley being most raised. Potatoes are looking well, with prospect of an excellent yield. The prospect for fruit, especially apples, is the best for years. Pastures are holding out well and stock is looking excellently.

Westminster (A. J. FOSKETT).—There is no serious trouble from insects. Indian corn is in good condition. There was more than an average yield of hay and it was of good quality. Peas and oats are our principal forage crop and are in good condition. Condition of market-garden crops good and those already harvested have yielded well and brought good prices. The prospect is good for a fair yield of apples, pears, plums and grapes. Pasturage is in good condition for the time of year. Rye, oats and barley have yielded well as forage crops.

Fitchburg (JABEZ FISHER).—Plant lice are doing some damage on the young shoots of apples and pears. Corn is looking well. The hay crop is fully up to the average in quantity and of good quality. Apples promise 80 per cent of a full crop; pears 50 per cent; peaches 60 per cent; plums 100 per cent and grapes 60 per cent. Fruits are smooth and fair. Pasturage is in good condition.

Harvard (JOHN S. PRESTON).—Indian corn is looking very well; none raised for the silo. The hay crop is large and was got in in good shape though a little late. Corn, oats and Hungarian are the principal forage crops grown, and some Japanese millet is being raised. Market-garden crops, including potatoes, are about as usual as regards yields and prices. The prospect is good for a large crop of all fruits except peaches, which will be light. Pasturage is better than usual at this time of year. Rye, oats and barley are about average crops, but are little raised for grain.

Holden (G. S. GRAHAM).—Insects of all kinds are in about the usual numbers. Corn though late is looking well; three-fourths of the crop will go into the silo. Hay is a good average crop of good quality. Japanese millet, oats and corn are the principal forage crops grown and all are looking well. Potatoes look finely, but none have been dug as yet. Baldwin apples seem rather scarce; peaches, pears, plums and grapes looking well. Pasturage is fully up to the average. Rye, oats and barley not raised for grain; all looking well.

Worcester (H. R. KINNEY).—The potato bug is causing some trouble. Corn as a whole is late and uneven, and will largely go into the silo. The hay crop has been good and of fair quality. Oats and millet are sown for hay and barley for fall feeding. Potatoes are late, but look well; vegetables have been plenty and cheap. Apples, peaches and plums look well; other fruits only

fair. Pastures are in good condition for the time of year. Crops are late, but as a whole look well.

Auburn (WM. GILBERT). — Potato bugs and tent caterpillars are doing some damage. Indian corn is looking finely; about 90 per cent of the crop is used for ensilage. Hay is considerably above a normal crop. Barley and peas and Japanese millet are the principal forage crops raised and they promise large yields. All market-garden crops are doing well, but prices are rather low. Apples and grapes promise full crops. Pastures are beginning to dry up. Rye, oats and barley are about normal, both in grain and forage.

Millbury (HERBERT MCCracken). — Potato bugs are doing some damage. Indian corn looks promising; perhaps half the crop will be used for ensilage. There is a large quantity of hay and the quality is excellent. Millet, barley, corn and Hungarian grass are the principal forage crops grown. Market-garden crops have yielded well and prices for peas and other vegetables have been good; potatoes not yet harvested. Apples will be a light crop; other fruits a fair yield. Pasturage is good, frequent rains keeping the grass along. Rye, oats and barley compare favorably with former years.

Mendon (J. J. NUTTER). — Potato bugs and striped squash bugs are doing some damage. Corn is little raised except for ensilage. There is a fair crop of hay of good quality. Corn, oats, Hungarian grass and millet are the principal forage crops grown. Market-garden crops are doing very well; prospect good for potatoes. There will be a small crop of all kinds of fruits. Pasturage is in very good condition. Oats and rye are very good crops.

Blackstone (O. F. FULLER). — Potato bugs are doing some damage. Indian corn is in good condition; but one silo in town. The hay crop was fully up to the standard in both quantity and quality. Considerable Hungarian grass, golden millet and Japanese millet have been sown. Market-garden crops are looking well. There will be a fair crop of apples, very few pears, no peaches, and few plums and grapes. Pastures are not in very good condition on account of dry weather. Rye, oats and barley are about normal crops.

MIDDLESEX COUNTY.

Sherborn (N. B. DOUGLAS). — Potato bugs and squash vine borers are doing some damage. Corn is looking well and of good color; one-third of the crop will go into the silo. The hay crop was of average quantity and mostly secured in good order. Oats, oats and peas, barley, Hungarian grass, Japanese millet and soy beans in limited amount are the forage crops grown, and their general

condition is good. Garden crops promise well; few potatoes dug as yet. Apples are a full crop; pears medium; no peaches; grapes promise well. Pasturage is very short. Rye, oats and barley are not raised except for forage and made good yields for that purpose.

Framingham (J. S. WILLIAMS). — Onion and cabbage maggots have been very destructive and potato bugs are plenty. Indian corn is looking finely, although here and there a piece was planted over, but is growing fast; four-fifths of the crop will go into the silo. Haying is about over in this vicinity, the crop being unusually heavy and of excellent quality. Corn, oats, Hungarian grass and Japanese millet are the principal forage crops grown; all are looking well and oats are very heavy. Market-garden crops are very promising and low prices will probably prevail; potatoes are looking well. The summer and fall apple crops will be better than that of the winter varieties; pears and grapes fair; other fruits light. Pastures have been good, but are now feeling the effects of dry weather. Rye winterkilled somewhat, but generally gave good results; oats have been a very good crop.

Sudbury (E. W. GOODNOW). — The potato bug is the most troublesome insect in this locality. Indian corn is looking well and about half the crop will be put into the silo. The hay crop is large and of excellent quality. Oats and corn are being raised as forage crops. Market-garden crops of all kinds are looking well, with prices about normal. Fruit of all kinds except peaches is looking well. Pasturage is not in good condition.

Littleton (GEO. W. SANDERSON). — Potato bugs are doing some damage. Corn is in good condition; about half the crop will probably go into the silo. Quantity of the hay crop one-third more than last year, and quality good. Corn is raised for the silo and Hungarian grass and millet to supplement the hay crop, and all are looking well. Market-garden crops are in good condition and prices compare favorably with those of former years. The prospect is good for apples; other fruits appear to be light crops. Pastures have been good until recently, but the dry weather has lessened the feed. Very little rye, oats and barley are raised for grain.

Groton (GEO. S. KNAPP). — Plant lice on young apple shoots and borers are our most troublesome insects. Corn is in good condition; about half the crop goes into the silo. Hungarian grass and millet are the principal forage crops. Market-garden crops, including potatoes, are in good condition. Early apples are a good crop, fall and winter varieties fair; pears fair; peaches short. Pastures are dry at present and feed is getting poor.

Chelmsford (P. P. PERHAM). — Potato bugs are our most troublesome insect. Indian corn is very backward, but is growing well now; half the crop will be used for ensilage. The hay crop is large and of good quality. Oats and barley sown together are used for feeding green and for the silo. Market-garden crops are about normal, but are now suffering somewhat from drought. Apples are a good crop; very few pears; no peaches; grapes promise well. Pastures are in poor condition at present. Rye, oats and barley are large crops, but are little grown for grain.

Billerica (GEO. P. GREENWOOD). — There is little injury from insects in this locality. There is a very heavy crop of hay of good quality. Corn is the principal forage crop raised and is looking very well. Market-garden crops, including potatoes, are in good condition; beans, peas, etc., are selling rather low. Apples have dropped considerably, but those remaining are very large and fair; some peaches; other fruits fair. Pasturage is in good condition. Rye, oats and barley are good crops. Sweet corn is raised to a considerable extent and is looking well.

Tewksbury (G. S. CROSBY). — Potato bugs are doing some damage. What little Indian corn there is in this locality is in good condition; not much will be put into the silo. The hay crop is nearly a third heavier than usual and of good quality. Hungarian grass and millet are the principal forage crops grown, with some oats and barley. The yield of market-garden crops is generally good, with prices lower than usual. All fruits except peaches will give fairly good yields. Pasturage is beginning to dry up somewhat, but the present rain will improve it. Rye is an unusually heavy crop and oats for fodder are also good.

Lexington (CORNELIUS WELLINGTON). — Brown-tail moths are under subjection; gypsy moths are troubling us somewhat, but there is little defoliation. Indian corn is doing well; little is raised except for ensilage. Quantity and quality of hay crop excellent. Corn and various kinds of millet are raised as forage crops and all are doing well. Pasturage was good until recently, but is now suffering from drought. Rye, oats and barley are little raised, except for forage.

Lincoln (C. S. WHEELER). — Potato bugs are doing some damage. Indian corn is very backward; very little will be put into the silo. Quantity of hay crop one-third above the average and quality good. Japanese millet, Hungarian grass and fodder corn are the principal forage crops, though some barley is going in for late feed. Market-garden crops are about average, except sweet corn, which is backward. There will be about an average crop of

fruit. Pasturage is in fair condition. Rye, oats and barley are above average crops.

Weston (HENRY L. BROWN). — Just now there is not much trouble from insects. Corn is looking well; more is planted for the silo than for ripening. There was about an average quantity of hay and the crop is of good quality. Millet and barley are the principal forage crops and are in good condition. Market-garden crops are looking well and those harvested have given good yields, but prices have been very low. There is a fair quantity of apples and pears; no peaches to speak of; plums very full and grapes an average crop. Pastures are dry and short. Rye, oats and barley were good crops for forage, but are not raised for grain.

ESSEX COUNTY.

Salisbury (WESLEY PETTENGILL). — Potato bugs are quite numerous and the only insect doing much damage. Corn is looking well but is a little backward; none used for ensilage. The hay crop is heavier than usual and secured in fine condition. Fodder corn and millet are the principal forage crops, with some oats, barley and Hungarian grass. Market-garden crops and potatoes are looking well. Fall apples will give a large yield, winter apples light; pears fair; peaches rather light, though some trees are bearing full; plums fair; grapes plenty. Pastures are looking as well as usual for the time of year, but high ground is getting dry and short. Rye, oats and barley are looking well for forage.

Amesbury (F. W. SARGENT). — Potato bugs are doing some damage, but there appears to be a scarcity of common insects this season. Indian corn is making rapid growth, although late in starting; half the crop will go into the silo. Hay was an average crop of excellent quality. Oats, corn, barley, Hungarian grass and Japanese millet are the principal forage crops grown. Market-garden crops are in good condition though late. Apples and pears are good; other fruits light. Pasturage is in good condition and the recent rain will keep it so. Rye, oats and barley are average crops.

Groveland (A. S. LONGFELLOW). — Potato bugs and onion maggots are doing some damage. Indian corn is looking well; perhaps one-fifth of the crop will be put into the silo. Hay is better than an average crop, of excellent quality. Oats and corn are raised as forage crop and are in good condition. Market-garden crops are looking well and so far have yielded well. Apples have dropped badly; pears promise a good crop and there will be some peaches and plums. Rye, oats and barley are fully up to average crops.

Rowley (DANIEL H. O'BRIEN). — Potato bugs and onion maggots are doing some damage. Indian corn is in fair condition; none raised for the silo. Hay was better than an average crop in quantity and quality. Hungarian grass and sweet corn are the principal forage crops raised and are in good condition. Condition and yield of market-garden crops medium and prices lower than usual. Apples and pears are fair crops; other fruits poor. Pastures are in very good condition. Rye, oats and barley are average crops. Apples dropped badly.

Wenham (N. P. PERKINS). — With the exception of the onion maggot insects have done less damage than usual. There is but little Indian corn in this vicinity, but there is a large acreage of sweet corn, of which part will go into the silo. As a whole the crop of hay will somewhat exceed last year. Corn is the principal forage crop grown, but Hungarian grass, Japanese millet, oats and barley are also raised for that purpose. No potatoes have been dug as yet and the prospect is not very good. There will be but few apples and pears, no peaches, but some plums and grapes. Pastures are now getting short and milch cows must be fed at the barn. Rye, oats and barley are not much grown but are fair crops.

Danvers (C. H. PRESTON). — Corn is in good condition and a large part of the crop will be used for ensilage. There was a large hay crop of good quality. Oats and peas, barley, corn and Japanese millet are the principal forage crops raised. Market-garden crops are in good condition, and those already harvested have yielded well, but have brought low prices. Apples fair, pears good, plums and grapes good. Pasturage is in good condition. Rye, oats and barley are good as forage crops.

NORFOLK COUNTY.

Randolph (RUFUS A. THAYER). — Potato bugs are doing some damage. Indian corn is in good average condition; nine-tenths of the crop will go into the silo. Hay was more than an average crop and of good quality. Corn, millet, oats and barley are the principal forage crops grown and all are in fair condition. Market-garden crops have made good average yields with low prices. Apples and pears will give half crops; no peaches or plums; grapes half a crop. Pastures are about as usual at this season. Rye, oats and barley are good average crops and all used for forage.

Canton (E. V. KINSLEY). — Indian corn is backward and nine-tenths of the crop will be fed to stock. Quantity of hay crop above average and quality good. Indian corn, the millets, especially Japanese millet, oats, barley and spring rye and peas are the

principal forage crops. Market-garden crops are in good condition, with varying yields and fair prices; some signs of blight on potatoes. Apples are a light crop; other fruits almost a failure. Pastures are getting very dry. Rye, oats and barley are good average crops. The milk supply is getting a little short.

Norwood (F. A. FALES). — Potato bugs and rose bugs are doing some damage. Indian corn is rather late; about 25 per cent of the crop goes into the silo. Hay is more than an average crop in quantity and of good quality. Oats and Japanese millet are the principal forage crops raised. Market-garden crops are looking well; but few potatoes have been dug. There will be a light crop of all kinds of fruit. Pasturage is in poor condition and much in need of rain. Rye, oats and barley are about average crops.

Westwood (HENRY E. WEATHERBEE). — Potato bugs and squash bugs are doing some damage, and cut worms did considerable the first of the season. Corn is backward, but is looking finely. Hay is above the average in quantity and quality. Hungarian grass, Japanese millet and fodder corn are the principal forage crops raised and all are looking well. Market-garden crops have yielded well and brought good prices; potatoes are looking well. Apples will not be up to the average for apple years; pears and peaches will be below the average; plums and grapes good crops. Pastures are now short owing to the hot, dry weather. Oats are rather light this year.

Walpole (EDWARD L. SHEPARD). — Fire worms on cranberry bogs and potato bugs are doing some damage. Corn is late; very little is raised for the silo. Hay is more than an average crop in quantity and better than usual in quality. Corn, barley, Hungarian grass and millet are the principal forage crops grown; corn is late, but the others are in fairly good condition. Potatoes are looking finely; market-garden crops are about as usual in yield and price. Apples will be half a crop; pears, peaches and plums light crops; others average. Pasturage has been good but is badly in need of rain at present. Rye, oats and barley are about average crops.

Franklin (C. M. ALLEN). — There are few insects of any kind. Corn looks well but is backward; half the crop goes into the silo. Hay is an average crop in quantity and quality. Millet and barley are the principal forage crops grown. Market-garden crops, including potatoes, are in better than average condition. Apples will give a good crop; pears light; no peaches; plums good; quinces fair; grapes light. Pasturage is in good condition. Rye, oats and barley are hardly average crops.

BRISTOL COUNTY.

Mansfield (WM. C. WINTER). — Cut worms have been very troublesome this season. Indian corn is late but is coming on finely now; little or none used for ensilage in this vicinity. Quantity of the hay above average and quality excellent. Oats and Hungarian grass are the principal forage crops; oats excellent and Hungarian rather backward. Market-garden crops are generally very uneven, coming up poorly; peas have been good; prices lower than usual. Potatoes promise well, but have not been dug as yet. Apples good; pears fair; no peaches; Japan plums fair; quinces fair; grapes and cranberries small crops. Pastures are in good condition as yet, but need rain. Rye, oats and barley are up to the usual average.

Attleborough (ISAAC ALGER). — Potato bugs are doing some damage. Indian corn is in good condition; 25 per cent of the crop will go into the silo. Hay is a good average crop in both quantity and quality. Millet, Hungarian grass and barley are the principal forage crops grown. Market-garden crops have yielded fairly well and promise equally well for the future. All kinds of fruit will be a small crop, except grapes. Pasturage is in good condition. Rye, oats and barley are about average crops.

Norton (WM. A. LANE). — Potato bugs are doing some damage. Indian corn is looking well, though backward. The hay crop was not as large as in former years, but was of good quality. Millet and Hungarian grass are the principal forage crops grown. Potatoes are looking well, but blight has appeared on some fields. There will be a small crop of fruit of all kinds. Pasturage is in good condition for the time of year. Rye, oats and barley are average crops.

Seekonk (FRED A. HOWE). — Potato bugs are doing some damage. Indian corn is looking very well; very little used for ensilage. Hay was hardly an average crop in quantity, but was of good quality. Barley is the principal forage crop grown. Market-garden crops are looking well, with prices lower than usual. Potatoes promise a fair crop. The fruit crop looks to be a very poor one. Pasturage is in good condition. Rye, oats and barley are about average crops.

Westport (ALBERT S. SHERMAN). — Potato bugs are the greatest pest we have. Indian corn is doing well and is of good color; none will be put into the silo in this vicinity. We have a good crop of excellent hay. Corn and oats are quite extensively grown for forage crops; also some millet, and all are looking well. Potatoes promise well, but very few have been harvested as yet.

Apples quite plenty; pears rather scarce; peaches and plums none; few quinces; grapes abundant; cranberries not grown. Pastures are getting dry and feed short. Rye, oats and barley are very good crops. Cabbages look well and turnips have a good start.

Dartmouth (F. H. MOSHER). — Fall web worms are very plentiful. Corn is in good condition, better than the average; a small proportion of the crop will go into the silo. Hay was a much better crop than last year and of better quality. Corn, oats and millet are the principal forage crops grown, in the order given. Market-garden crops are in good condition. There are not many late apples, early ones better but not good; but few pears and peaches. Pastures are not holding out well. Rye, oats and barley are good crops, but little raised for grain. Onions are nearly a complete failure in this section. Raspberries are turning out an average crop.

PLYMOUTH COUNTY.

Brockton (DAVIS COPELAND). — Potato bugs and squash bugs are doing some damage. Indian corn is looking well, although it is a little late; about forty per cent of the crop will go into the silo. Hay is on the whole about an average crop as regards both quantity and quality. Corn for the silo and oats and peas to feed green are the principal forage crops raised and are in fairly good condition. Market-garden crops are fairly good with prices low; not many potatoes harvested as yet. All fruits are poor except grapes, which look to be plenty. Pastures are dry. Rye, oats and barley are about average crops.

Hanover (HARRISON L. HOUSE). — Potato bugs are doing some damage. Indian corn is in fair condition, but later than usual; no silos in this vicinity. Hay is fully up to the average in quantity and quality. Some corn and oats are raised as forage crops and are in good condition. Market-garden crops are good but later than usual, with prices rather lower than for the last few years. Apples good; pears scarce; no peaches; plums and grapes plentiful; cranberries plenty and good. Pasturage is fairly good, but is now rather dry. Rye, oats and barley are very little raised.

Hanson (F. S. THOMAS, M.D.). — Potato bugs are doing some damage and something, probably the elm leaf beetle, is working on the elms. Corn is in good condition; but little of it will be used for ensilage. Hay is a superior crop in both quantity and quality. Corn, oats and Hungarian grass are the principal forage crops grown. Market-garden crops, including potatoes, are in good condition and bring the usual prices. Early apples good,

winter varieties poor ; no peaches ; few plums ; grapes fair ; hail destroyed cranberries. Pastures are in fine condition.

Marshfield (JOHN H. BOURNE). — Cut worms and white grubs are doing some damage. Corn is rather late but is making good growth, and the prospect for the crop is much better than last year at this time ; one-tenth of the crop will go into the silo. The hay crop was a little better than that of last year and of fairly good quality. Corn, oats and peas are the principal forage crops, but are not very extensively raised. Market-garden crops are in good condition ; more potatoes than usual and the early ones now dug were never better. Apples and pears are average crops ; plums few ; some grapes looking well, others not ; hail destroyed many cranberries. Pastures are in good condition. Rye, oats and barley are good crops and the heads of rye and oats are long and well filled out.

Plympton (WINTHROP FILLEBROWN). — Potato bugs and cut worms are our most troublesome insects. Corn has improved greatly the past two weeks ; we have no silos. On high land hay is excellent, but low land did not do as well. Rye, corn, peas, Hungarian grass and oats are used extensively for fodder. Potatoes are in fine condition ; garden crops in general have made rapid growth the past three weeks. Apples promise a good yield ; pears, peaches and plums light ; quinces, grapes and cranberries excellent. Pasturage is in about the usual condition and the present rain is doing it much good. Rye, oats and barley are about average crops.

Carver (J. A. VAUGHAN). — There have been but few insects, potato bugs and currant worms being the most destructive. Hay was a good crop and all secured in fine order. Corn is the principal forage crop and is looking well. Market-garden crops have made good yields and brought good prices. There is a fair crop of apples, but few pears and no peaches. Pasturage is in fair condition. A few cranberry bogs were partly winterkilled, but most of them started well to be injured by the June frost, while a severe hailstorm destroyed the crop on many bogs.

Mattapoisett (E. C. STETSON). — Indian corn is in good condition ; no silos in this vicinity. There was a large hay crop of fair quality. Corn, barley and cow peas are the principal forage crops grown and are in good condition. Market-garden crops, including potatoes, are in good condition and those already harvested have been about average in yield and price. Apples promise a good yield ; pears and peaches poor ; plums and grapes good ; cranberries poor. Pasturage is in good condition. Rye, oats and barley are as good as the average, or a little better.

BARNSTABLE COUNTY.

Bourne (DAVID D. NYE). — Potato bugs are doing some damage, but less than last year. The condition of Indian corn is very encouraging; no silos in this vicinity. Quantity and quality of hay crop far ahead of last year. Corn, peas and oats are the principal forage crops grown. Market-garden crops are in fine condition, especially potatoes, and those harvested compared favorably with former years in yield and price. Fruit appears to be a smaller crop than last year, although there is some of all kinds. Pasturage is looking very well, though two weeks of dry weather has somewhat affected it. Root crops are doing well.

Mashpee (W. F. HAMMOND). — Potato bugs and cut worms are doing some damage. Indian corn is above the average in condition; none used for ensilage. The hay crop is above the average in quantity and quality. Corn and oats are our principal forage crops. Market garden crops are about average in yield and price. Apples promise to be half a crop; no pears, peaches, plums or quinces; grapes half a crop; cranberries average. Pasturage is above the average in condition. Rye and oats are about average crops.

Dennis (JOSHUA CROWELL). — There are very few insects just at present, potato bugs being the most troublesome. Corn is in very good condition; none is used for ensilage. The hay crop was fully up to the average in both quantity and quality. Corn is the principal forage crop grown, with a little Hungarian grass, and both are in good condition. Market-garden crops are in good condition and those already harvested have compared favorably with other years in both yield and price. Apples a medium crop or less; pears good; cranberries rather below the average. Pasturage is excellent for this season of the year.

Harwich (AMBROSE N. DOANE). — Cranberry vine worms and potato bugs are doing some damage. The corn crop is in fair condition; but one silo in town. The hay crop is better than last year in quantity and quality. Corn is the principal forage crop grown and is looking remarkably well. Potatoes are much higher than usual in price, but of poor quality. Apples promise a fine crop; grapes average; cranberries very much damaged by worms eating the blossoms. Pastures are in good condition. Rye and oats are good crops. The cranberry crop will be half that of 1903, having suffered from frost, hail and insects.

Eastham (J. A. CLARK). — No insects are very troublesome. Indian corn is but little raised. The hay crop is good both in quantity and quality. Market-garden crops are in good condition

and those already harvested have compared well with former years in yield and price. The prospect is poor for fruit of all kinds. Pasturage is in fair condition. Rye, oats and barley are very little raised.

DUKES COUNTY.

West Tisbury (GEO. HUNT LUCE).—Potato bugs are doing some damage. Corn is in good condition; a small part of the crop will be put into the silo. Hay is above the average in quantity and quality. Corn and millet are raised to eke out the pastures. Market-garden crops are in good average condition. There is the prospect of a fair crop of apples. Pasturage is in good condition. Oats are below the average in yield. Hop fields are doing well.

NANTUCKET COUNTY.

Nantucket (H. G. WORTH).—Insects are less troublesome than usual. Indian corn has improved very much in the last two weeks; no silos in this county. The hay crop was about a third above last year in quantity and of average quality. Corn is the principal forage crop grown and is looking well. Market-garden crops are in good condition, and the yield and price of those harvested has been up to the average. Cranberries are looking fairly well; grapes good; no other fruit raised in this county. Pasturage is in good condition. More oats are raised than all other grain, some farmers having over thirty acres. A large number cut their oats in the milk and use them for hay.

BULLETIN OF MASSACHUSETTS BOARD OF AGRICULTURE.

THE GYPSY AND BROWN-TAIL MOTHS.

By A. H. KIRKLAND, M.S., Boston, Mass.

Westward the course of insect damage takes its way. Civilization, after all, has hard work to escape from some of its drawbacks. It is unfortunate that in the westward march of mankind certain foes which levy a constant and heavy tax on the products of the soil could not have been left behind; yet the agencies of commerce are subject to natural laws, and in bringing to a new land the plants, trees and seeds of other climes, have naturally brought also many of the insect pests of foreign lands. Recently a nurseryman brought to Boston by accident a serious scale insect of stone fruits. The elm leaf beetle was introduced at Baltimore in the early part of the nineteenth century in packings surrounding a lot of European elms. Within a few years a grower of Dutch roses at Somerville, Mass., imported with his bushes the serious and annoying brown-tail moth pest. These instances, taken at random, show the danger to which we are continually exposed by unrestricted commercial activity. On the other hand, we have abundant evidence that nowhere in the world has the subject of economic entomology received the attention or reached such a state of development as in our own land. This potential knowledge has been particularly valuable in the case of warfare against imported insect pests.

Foes of this class are usually on a different basis than native species. In its native environment a species is subjected to the balancing process of nature. In other words, it feeds and is fed upon. It destroys the foliage, perhaps, of some staple crop, and in turn is attacked by parasites, predaceous insects and birds. Its numbers may vary from year to year, but when it becomes over-abundant it immediately offers a larger food supply for its natural enemies. They soon gain ascendancy, the host insect is reduced in point of numbers and its ravages may even cease to be noteworthy. A knowledge of this shifting relationship, this "balance of nature," is of importance since it underlies the problem of dealing with all insect pests, particularly those of foreign origin.

Take the case of the gypsy moth for example. This creature was brought here free from the controlling influence exerted by half a hun-

dred parasites and a score or more insectivorous birds. In other words, the natural checks on its increase were left behind, and for years it has occupied a rank of first magnitude as an insect pest in Massachusetts. Its ravages the past year in the metropolitan district have been most severe, causing an immense amount of damage in park and woodland areas, and even depreciating the value of real estate in the worst afflicted sections.

THE GYPSY MOTH.

Now that the damage by the moth has again reached such magnitude, a little ancient, but hitherto unpublished, history will be of interest. Soon after the civil war, as is well known, there lived in the Glenwood district of Medford Prof. Leopold Trouvelot, a French astronomer and naturalist. In connection with his experiments on various silkworms

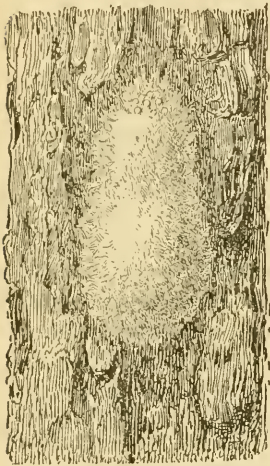


FIG. 1. Egg cluster of gypsy moth.

he introduced the notorious gypsy moth, and the same accidentally escaped from his care. Professor Trouvelot could never be induced, after his return to France, to commit himself in writing as to the manner in which the moth escaped. Some years ago, however, the late Alvin Clark of Cambridge visited him at the observatory at Mendon, France, and learned from him that the gypsy moth caterpillars were confined by netting on shrubs in his yard, that the nettings became broken by a wind storm and the caterpillars thus scattered and commenced their spread. This undoubtedly happened in the early summer of 1868, for an obscure note by Walsh-Riley in volume 1, number 3, "American Entomologist," November, 1868, gives an account of the event. Other notes by Riley

in his Missouri report for 1870 and in volume 2, "American Entomologist," 1870, show that Trouvelot must have directly or indirectly communicated to him the fact of the moth's escape. In other words, Trouvelot, recognizing the possible danger from the moth, did his duty in calling public attention to it. How unfortunate that this warning was ignored!

The gradual spread of the moth up to the caterpillar plague of 1888-89 is a matter of record. Equally well known is the work of the gypsy moth committee of the Massachusetts Board of Agriculture, which finally succeeded in reducing the numbers of the insect to a minimum and thoroughly controlling the pest. Since the abandonment of the State work in the early part of the year 1900 the moth has had ample opportunity to increase to a point where it is to-day more numerous, and occupying a larger area in this State, than ever before. Such severe outbreaks of this insect as we have witnessed during the past two years are inevitably accompanied by a great spreading of the moth into non-infested territory.

This makes it important that property owners should be on the lookout for the insect and promptly stamp out infestations as soon as discovered.

Life History.

The life history of the gypsy moth follows along lines common to our principal caterpillar pests. The eggs, smaller than a pin head, are laid in masses of five hundred or more on trunks of trees, stone walls, fences, etc. At the time of egg laying the female moth covers the egg cluster with an abundant coating of yellow hair from the surface of the abdomen. The completed egg mass is from one to one and one-half inches long by half an inch in width, and rounded at each end. Egg laying takes place in July and August, and as the eggs do not hatch until the following April or May the insect is open to attack in that stage throughout a large part of the year. The eggs hatch as early as the 15th of April in favorable seasons, although the hatching period may be delayed well into May. Egg masses on the south side of trees, walls, etc., hatch first, while those laid in places where the sun does not penetrate may be delayed until the early part of June. The extreme variation noticed in date of hatching was from April 1 to June 17.

Leaving the common mass the young caterpillars crawl about in search of food, and if foliage is not then available do not hesitate to attack the swelling buds or even the bark of tender twigs. Nature has endowed these tiny caterpillars with the ability to exist without food for a week or more, and they may wander nearly one hundred feet in the mean

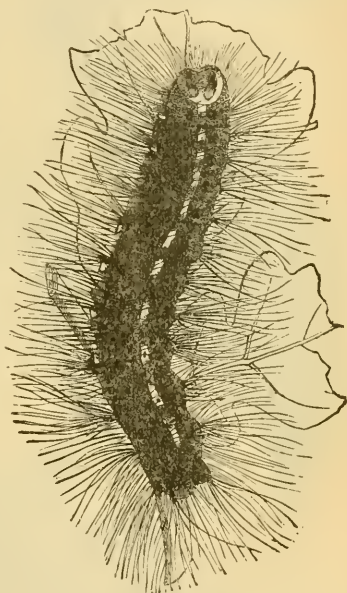


FIG. 2. Full-grown caterpillar of gypsy moth.

time. Their spreading, however, from place to place does not depend on the actual distance over which the caterpillar may be able to crawl. Each of these tiny insects commences to spin a silken thread as soon as hatched, and thus suspended they are caught up by the wind and blown from place to place and upon vehicles.

As the insects feed they cast their skin from time to time, five or six molts being the rule, when by midsummer the large brown hairy caterpillars are ready to enter the pupal stage. From July 1 to 15 the majority of the caterpillars pupate under the branches, on the trunks of trees and in stone walls and other partially sheltered spots. A little over two weeks is required for the pupal state, the brown male moths appearing a few days in advance of the large white females. The difference in mark-

ings between the sexes is very noticeable. The fact that the male moths fly actively, while the females do not, is also of interest, and has an economic importance as well, because to a great extent this restricts the spreading of the insect.

Distribution.

We have spoken of the natural spreading of the pest, but the artificial distribution by the insects falling on teams and other vehicles is much more important. Teams passing under infested trees early in the spring, or even when the caterpillars are half grown or more, take on a number of these accidental insect passengers and transport them from place to place. In this way the moth has become thoroughly distributed along the main lines of travel. Wood roads and other places much frequented

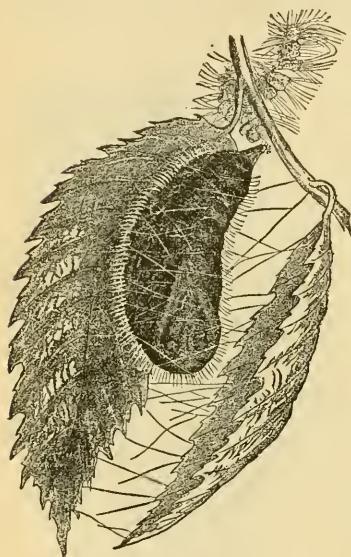


FIG. 3. Pupa of gypsy moth.

by the public are also generally infested. The grounds around Bunker Hill Monument and at Mount Auburn Cemetery are two localities which remain infested from year to year, and which well illustrate the point. However severe the suffering and loss which have occurred in recent years in the metropolitan district, it is not to be compared in its economic significance with that which will result through the spreading of the moth into non-infested areas. Large colonies such as now exist in Arlington, Medford or Malden continually menace not only the territory immediately contiguous but also the towns and cities lying along the lines of travel which pass through these regions. The writer has repeatedly found the caterpillars on his team after a day spent in the moth

colonies. Several people have reported finding the gypsy moth caterpillars in electric cars. At the Oak Grove station on the Boston & Maine Railroad the caterpillars literally have hung in festoons, under which it was practically impossible for passengers to walk without picking up one or more caterpillars. Dr. L. C. Jones of Malden, an observant naturalist as well as a skilled physician, informs the writer that he has seen female moths in considerable numbers laying their eggs on trucks and sides of freight cars at the Oak Grove station. These few facts taken at random from a large number of authentic instances show the means by which the moth is spreading from the neglected colonies, and portend a wide distribution of the insect in the course of a few years.

Food Plants.

The gypsy moth caterpillar is remarkably polyphagous. It feeds readily upon practically all our common fruit and forest trees. The

apple, oak and willow would seem to be slightly preferred over some other species of trees, but in a badly infested colony everything in the shape of foliage is attacked. Certain species, such as the white ash and rock maple, are attacked to a less extent than other shade trees, but even they are not exempt. Coming from a badly infested section the caterpillars have been known to eat all kinds of garden vegetables with the exception of onions, as well as to destroy flowers, grass, etc. The effect of the feeding of the gypsy moth is shown first in the little growth made by the infested trees. Pines and other coniferous trees die as a result of a single stripping, while the oak, the apple and other deciduous trees are killed by three years' continual defoliation. The fact that the moth feeds on so many kinds of foliage makes it a particularly difficult insect to combat, since it seldom lacks for suitable food.



FIG. 4. Male gypsy moth.

Remedies.

The remedies most useful against the gypsy moth are governed largely by the season at which the moth colony is found and the size and extent of the same. Certain wholesale methods are very effective but can only be applied by municipalities or property owners of large means.

Cutting and Burning.—This process includes the cutting out of infested woodland, destroying the underbrush and thinning the trees.



FIG. 5. Female gypsy moth.

This work is done to best advantage in the winter season, and should be preceded by destroying the eggs so as to prevent scattering of the same. The effect is to limit the foliage on which the insects can feed, and to prepare the woodland for thorough work during the following caterpillar season. The brush and other refuse should be burned early in May, *after* the caterpillars have hatched. At this time a large number of insects will be on the ground and will thus be destroyed.

Burning with Oil.—Where caterpillar colonies are found late in the summer it is often desirable to burn over the ground with oil, particu-

larly where there is much underbrush to harbor the insects. This work is accomplished by means of a small tank, to which is connected a light suction pump. Crude oil is used and is forced out of the spray pole attached to the outfit, and makes a flaming torch which instantly consumes all forms of insect life. In using this outfit due care must be taken not to injure trunks of the trees.

The method applicable to private estates or available for parties of small means would include first of all the important work of egg destruction.

Egg Destruction. — This is best accomplished by searching out the egg clusters in the fall or winter and soaking them with creosote mixture. This mixture consists of crude creosote oil charged with varying percentages of coloring matter and carbolic acid. It is now offered in the market by several firms at prices ranging from seventy-five cents to one dollar per gallon, depending upon quantity. It is well to use a mixture containing considerable coloring matter, so that nests which have been treated shall show a distinct color. Where plain creosote oil is used the coloring soon fades out, and by the following spring it is difficult to distinguish treated from untreated nests.

Burlapping. — This consists of tying a burlap band around the tree trunks, thus affording the insects an artificial shelter during the day. The burlap strips should be about six inches wide and tied around the tree by means of a cord in the middle. Later both edges of the strip are pulled down. After the caterpillars are half grown they feed by night and will hide under the burlap during the day. The burlaps should be examined every day and the insects under them destroyed by hand.

Spraying. — The use of arsenical poisons, particularly some form of arsenate of lead, applied as a spray to the foliage is very effective, and alone is often depended upon to hold the insect in check. Some form of arsenate of lead paste should be used at the rate of about ten pounds to one hundred gallons of water. The spraying solution should be kept well stirred and applied on a clear, dry day.

For the work of spraying, a simple hand outfit will suffice where shrubbery alone is to be treated. For work on fruit trees or shade trees of any size the barrel pump is necessary, while for use in woodlands or parks one of the larger park outfits would be found economical. Thus the cost of a sprayer will vary from one dollar and twenty-five cents for the simple cheap hand sprayers to twenty-five dollars for a barrel outfit, and so on to sixty dollars or more for a park outfit. Many parties in the business of spraying use power outfits costing as high as five hundred dollars or more.

In fighting the gypsy moth it should be borne in mind that the process must be a continuous one; in other words, the insects must be dealt with every year. There is no case in applied entomology known to the writer where constant and thorough work will yield greater returns. It is much cheaper and easier to suppress the moth before it gets a foothold than to attempt to wipe out a large colony. A little patient work every winter and spring in the matter of egg destruction and burlapping will hold the pest in check, provided, of course, that there can be coöperation throughout the community.

Where such mutual help cannot be obtained, and the moth is allowed to increase on neighboring estates, there is available for use the final method of banding the trees with some sticky material, such as raupen-leim, or its American substitute, bodlime. Tar or printer's ink or even sticky fly paper are also used for this purpose. These bands should be put on as soon as the eggs hatch in the spring, and should be kept fresh and sticky throughout the summer. Their effect is to preserve the trees from damage by migrating hordes of caterpillars.

THE BROWN-TAIL MOTH.

The European brown-tail moth was first found in Massachusetts in May, 1897. In Europe it has been known as a common pest of fruit trees for generations. In fact, the earliest works on fruit-tree insects



FIG. 6. Winter web of brown-tail moth caterpillars.

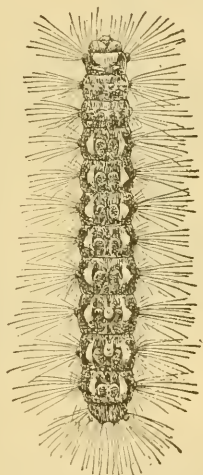


FIG. 7. Brown-tail moth caterpillar, enlarged.

mention this pest as being one of the most common. When one considers the strange habits of the caterpillars in wintering in the webs at the tips of the twigs, coupled with the fact that large quantities of ornamental shrubs are annually imported from Europe to this country, the wonder is not so much that the pest finally found its way here but that it did not reach us much sooner. It is, however, remarkable that two such notorious pests as the gypsy and brown-tail moths should have been transported thousands of miles across the sea, one purposely and the other accidentally, and both become colonized in eastern Massachusetts, and within five miles of each other.

The first outbreak of the brown-tail moth covered only a few square miles in Somerville and Cambridge. It was sufficient, however, to yield an immense swarm of moths, which flew or were drifted by a high wind throughout the whole north-eastern section of the State. In the case of

this insect the female moth flies readily, and being caught by the wind is often transported great distances. The caterpillars do not spin down from trees to the same extent as those of the gypsy moth but are no doubt more or less transported by vehicles. However, the main and important distribution of the moth takes place during the flying season. In addition to the effect of the wind, these insects are also strongly attracted to light. It results, therefore, that a swarm of moths arising from any infested spot and being drifted by the wind out of their immediate environment fly to the nearest mass of lights. Thus the centres of cities and towns become first infested, and here are established the colonies from which a more general infestation takes place. Electric cars, railroad trains and even steam-boats serve to transport the moths. The writer has repeatedly seen them, attracted by the lights, enter into the street or steam cars and be carried for many miles.

A reliable observer, Mr. A. M. Cobb, Malden, Mass., reports that when the Bangor boat of the Eastern Steamship line was passing some miles



FIG. 8. Female brown-tail moth.

off Marblehead, early in July of the present year, a large swarm of the brown-tail moths came aboard and completely covered parts of the vessel. Dr. James Fletcher, entomologist, Central Experiment Farms, Ottawa, Can., has recently reported finding brown-tail moths near the wharves of St. John, N. B. We know that in seven years' time the small colony at Somerville has spread throughout the

whole eastern part of Massachusetts, through southern New Hampshire and well into Maine. This rapid spreading of the insect indicates that within a few years it will be well distributed throughout New England.

Life History.

The brown-tail moth lays from two hundred to four hundred small globular eggs, thickly covered with a mass of brown hairs from the tip of the abdomen of the moth. The typical egg mass is about two-thirds of an inch long and about one-quarter of an inch wide. While the eggs are occasionally deposited on branches or trunks of trees, or even on lamp posts or house walls, a very large majority are laid on the under surfaces of the leaves of fruit and shade trees. The moths show a strong liking for pear trees, and will apparently seek out trees of this species in preference to any others. At the same time the apple, wild cherry and white oak are very commonly infested by the insect, while other trees suffer to some extent.

The eggs, laid in July, hatch the following month, and the young caterpillars, feeding in a mass, soon commence their work of spinning their winter webs. In making this web a number of leaves in the vicinity of the egg clusters are drawn together and are carefully spun in with a tenacious silken web. From this web the caterpillars go forth to feed on warm days, returning at night, and with the approach of cold weather enter the web and close with exit holes. We then have the strange phe-

nomenon of a caterpillar wintering over when only one-quarter grown and emerging the following spring to complete its life history. Whatever extremes of cold we have in Massachusetts do not seem to affect these insects adversely. They emerge early in the spring, eat first the buds, then the blossoms, and attack the foliage of fruit trees as soon as it develops. Their appetite seems to be in proportion to their winter's fasting period. Certainly no insect could be more voracious for the time spent in the caterpillar stage. The full grown caterpillar is light brown with a white stripe on either side and about two inches in length. Stripping the foliage of one tree they march to another, and so continue until full grown, when the cocoons are spun within the leaves at the ends of the branches, or sometimes on the tree trunks. The pupation usually takes place the latter part of June, and the moths emerge from the first to the twentieth of July. The snow white female moth is conspicuously marked with an enlarged tuft of brown hair, which gives to the insect its common name.

Nettling by the Caterpillars.

The damage by the caterpillars to the fruit trees is only a part of the story. Whenever these insects come in contact with human flesh they produce a most severe and painful nettling. This is apparently not due to any poisonous material in the hairs but rather to the finely barbed and brittle hairs themselves. So severe is this affection that in many cases people have been made seriously ill by it. The best remedy for it is the liberal use of cooling lotions, or, what is more satisfactory, even if less pleasant, the free use of common vaseline.

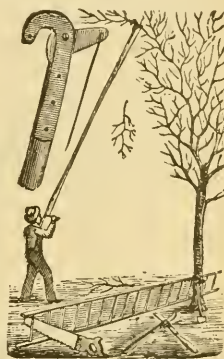


FIG 9. Pruning shears suitable for removal of winter webs.

Remedies.

The habit of the caterpillar in wintering over in webs at the tips of the leaves gives a key to the simplest and cheapest remedy, which is merely to cut off and burn the webs during the fall, winter or spring. This preventive means is most effective, and gives such excellent results that in Germany, France and Belgium there is a law making it obligatory on property owners to destroy the webs during the winter season. Where citizens neglect to carry out this work it is done for them, and the sum thus expended added to their tax levy.

Winter Work.

The work of removing the webs is best done by the use of a long-handled tree pruner or similar device. Particular pains should be given to gathering the webs and burning them, as any left on the ground will yield caterpillars and continue the infestation locally. As showing how cheaply the webs may be gathered where a general campaign is made the figures of work done by employees of the gypsy moth committee in

1899 are of interest. At that time over nine hundred thousand webs were destroyed at the total outlay of nine thousand seven hundred dollars.

Spraying. — Spraying is very effective against these insects; in fact they are much less resistant to the action of poison than is the gypsy moth or elm leaf beetle. To secure best results spraying should be done as soon as the foliage develops in the spring. Five pounds of the arsenate of lead paste to one hundred gallons of water is sufficient, or, if preferred, one pound of good Paris green kept well stirred may be applied in one hundred and fifty gallons of water.

Where the caterpillars swarm from trees along fences or on house walls the use of kerosene emulsion or strong soap suds is advisable. Fall spraying with arsenate of lead is also effective, but the feeding of the caterpillars at that time of the year is usually of minor importance.

Little good can be done in the way of collecting the eggs or trapping the moths by light, although many of the mature insects are destroyed by arc lamps. There is no method of combating the brown-tail moths that will give better results for the outlay than the destruction of the webs in the winter season, and this if thoroughly carried out will be a sufficient protection against damage by the insect. Cases will arise where the caterpillars swarm from adjoining estates, and where this occurs banding the trees with some sticky material as heretofore described will protect the foliage from harm.

Systematic Control.

Both the gypsy and brown-tail moths can be controlled by a thorough campaign over the infested municipalities. The work of the former gypsy moth committee has shown that the damage and annoyance from these pests can be practically eliminated by the application of thorough remedial measures over the entire infested districts. It is greatly to be hoped that some effort to systematically control the spread of these pests may be instituted, to the end that property owners may be spared the annual visitation of the caterpillar scourge.

Until then, however, eternal vigilance is the price we must pay if our trees are to be preserved.

MASSACHUSETTS
CROP REPORT

FOR THE
MONTH OF AUGUST, 1904.

HARVESTING AND MARKETING APPLES.

*ISSUED MONTHLY, MAY TO OCTOBER, BY STATE BOARD OF
AGRICULTURE, STATE HOUSE, BOSTON, MASS.*

J. LEWIS ELLSWORTH, *Secretary.*

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CROP REPORT FOR THE MONTH OF AUGUST, 1904.

OFFICE OF STATE BOARD OF AGRICULTURE,
BOSTON, MASS., Sept. 1, 1904.

Bulletin No. 4, Crop Report for the month of August, is presented herewith. Attention is called to the article at the close of the Bulletin on "Harvesting and Marketing Apples," by Prof. F. A. Waugh, professor of horticulture at the Massachusetts Agricultural College. As this is the "apple year" in Massachusetts something on this subject was thought to be desirable, and this crop report, appearing just before apple harvest commences, a desirable medium for giving it out. Professor Waugh does not attempt to go into the details of all processes in harvesting, handling and marketing the apple crop, the space allotted him not being sufficient, but he covers the principal points in an illuminating manner and the article should contain many new ideas for those who do not make orcharding their principal business, but with whom the apple crop is nevertheless of considerable importance. His suggestions in regard to the selling of the crop and as to the crop of the present year should be of especial value.

PROGRESS OF THE SEASON.

The monthly report of the Chief of the Bureau of Statistics of the United States Department of Agriculture (Crop Reporter for August, 1904) shows the condition of corn on August 1 to have been 87.3, as compared with 86.4 a month earlier, 78.7 on August 1, 1903, 86.5 at the corresponding date in 1902, and a ten-year August average of 83.5.

Preliminary returns indicate a winter wheat crop of about 333,400,000 bushels, or an average of 12.3 bushels per acre, as compared with 12.3 bushels last year, as finally estimated. The average condition of spring wheat on August 1 was 87.5, as compared with 93.7, a month earlier, 77.1 on the

corresponding date in 1903, 89.7 in 1902, and a ten-year August average of 81.2. Rust had made its appearance in some counties, but it was too early to estimate definitely the extent of damage from it.

The average condition of the oat crop on August 1 was 86.6, as compared with 89.8 a month earlier, 79.5 in 1903, 89.4 in 1902, and a ten-year August average of 82.7. The proportion of the oat crop of last year still in the hands of farmers was estimated at 5.4 per cent, as compared with 7.4 per cent of the crop of 1902 in farmers' hands at the corresponding date in 1903, 4.2 per cent of the crop of 1901 in farmers' hands two years ago, and a nine-year average of 7.4 per cent.

The average condition of barley was 91.8, as compared with 90.8 a month earlier, 87.2 in 1903, 90.5 in 1902, and a ten-year average of 86.2.

The acreage of buckwheat is less than that of last year by about 10,800 acres, or 1.3 per cent. The average condition of buckwheat on August 1 was 92.8, as compared with 93.9 in 1903, 91.4 in 1902, and a ten-year average of 90.3.

The average condition of flax on August 1 was 78.9, as compared with 86.6 a month earlier, and 80.3 on August 1, 1903.

The average condition of tobacco was 83.9, as compared with 85.3 a month earlier, 82.9 on August 1, 1903, and a five-year average of 81.1.

The average condition of potatoes was 94.1, as compared with 93.9 a month earlier, 87.2 on August 1, 1903, 94.8 at the corresponding date in 1902, and a ten-year average of 84.6.

Preliminary returns indicated an increase of 0.2 per cent in the hay acreage. The average condition of timothy hay on August 1 was 94, as compared with 92.2 in 1903, 90 in 1902, and a nine-year average of 85. Reports as to the production of clover indicated that nearly a full crop will be harvested. In point of quality the crop of clover is well up to highest medium grade.

The average condition of pasture August 1 was 95.5, as compared with 95.8 a month earlier, 94.9 on August 1,

1903, 97.1 at the corresponding date in 1902, and an eight-year average of 84.5.

The average condition of rice on August 1 was 90.2, as compared with 88.2 a month earlier and 92 in 1903.

In Massachusetts the average condition of corn was 92; the average condition of oats 98, and the proportion of the crop of 1903 still in farmers' hands 3.5 per cent; the average condition of spring rye 98; the acreage of buckwheat as compared with last year 115, and the average condition 97; the average condition of tobacco 97; the average condition of potatoes 101; the acreage of hay compared with last year 101; the average condition of timothy hay 100; the production of clover as compared with a full crop 96, and the quality, 100 standing for high, 99; the average condition of pasture as 100; the average condition of apples as 97; and the average condition of grapes as 92.

TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM UNITED STATES CLIMATE AND CROP BULLETINS.]

Week ending August 1. — The week was slightly warmer than usual over the greater part of New England and in portions of the northern and southern Pacific coast districts, the average daily departures from normal temperatures being less than 3°. Nearly normal temperatures prevailed in the middle Pacific coast districts and over the Rocky Mountain slope and much of the Lake region. From the upper Lake region westward to central Montana and south-eastern Idaho and generally throughout the Southern States, the week averaged cooler than usual, the deficiency ranging from 3° to 6° per day over the greater part of the South Atlantic and Gulf States. The rainfall of the week was very unequally distributed in the districts east of the Rocky Mountains, but for the most part was ample for the needs of growing crops, being excessive in portions of the central valleys and the Southern States. In the northern portion of the central Gulf States, along the immediate Atlantic coast northward of the Carolinas, and over a considerable part of the Ohio and Missouri valleys and the lower Lake region the rainfall was below the average. The southern Plateau

region experienced a week of showery weather to its great relief. There was no rain on the Pacific coast except very light showers in Washington and northern Oregon.

Week ending August 8. — The week was warmer than usual over the western Plateau districts and on the Pacific coast. A slight excess in temperature was also shown over the northern portion of the Middle Atlantic States and the greater part of New England, the departures from the normal in these districts being generally below 3°. Over most of the lower Lake region, Ohio valley, Tennessee and the northern portion of the South Atlantic States the temperature differed but little from the normal, slight deficiencies being generally reported. In the western portion of the upper Lake region, the upper Mississippi and Missouri valleys, and over the eastern slope of the Rocky Mountains and Gulf States the week averaged cooler than usual. In the Southern States the rainfall was very heavy and generally largely in excess of the average. Through the Gulf States and on the South Atlantic coast the total fall ranged from 2 to 6 inches, while amounts ranging from 2 to 4 inches were reported from the coast districts from the Carolinas northward to southern New England. In northern New England and generally throughout the Lake region and central valleys the week was drier than usual, large areas being entirely rainless. There was a continued absence of rain over a large part of the Plateau and Pacific coast regions.

Week ending August 15. — The week was generally cooler than usual in the districts east of the Mississippi and in the west Gulf States. In the lower Ohio Valley and in the south Atlantic coast districts the temperature differed very slightly from the normal. The week was also slightly cooler than usual over the central portion of the southern Plateau region and along the immediate middle and north Pacific coasts. Over most of the northern Pacific coast region, and generally throughout the middle and northern Plateau districts and the north-eastern Rocky Mountain slope the week averaged warmer than usual. Much of the Atlantic and Gulf coast districts and a considerable part of the central Missouri and upper Mississippi valleys and the Lake

region received more than the average rainfall during the week, while less than the average amount fell over most of the Ohio, central Mississippi, and lower Missouri valleys, and over the northern portion of the Gulf States. Over a large area extending from western Texas north-eastward to southern Missouri there was little or no rainfall, and like conditions prevailed over a considerable part of the Ohio valley.

Week ending August 22.—The week was cooler than usual in the northern districts from the upper Lake region westward to the eastern portions of Washington and Oregon, including the greater part of the central Plateau region. A very slight deficiency was also shown over the upper Mississippi Valley and in portions of the lower Lake region and Middle Atlantic States. Over the greater part of the central valleys and New England the temperature averaged nearly normal. In the Southern States and generally throughout the Pacific coast districts the week was warmer than usual. The rainfall was very heavy from the eastern portions of Nebraska, Kansas and Oklahoma to New England, from 1 to 3 inches falling over portions of the Lake region and New England. There was also more than the average rainfall over the southern Plateau region, but over the middle Plateau and Pacific coast districts there was little or no rain. Throughout the Southern States, with the exception of a few limited areas, the rainfall was below the average, very little falling in the districts to the west of the Mississippi.

SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

Week ending August 1.—New England. Boston: Weather favorable for crop growth, but unfavorable for harvesting; hay crop large, over half secured; potatoes and tomatoes promise large yields; garden vegetables and truck plentiful; apples developing well, good crop promised; plums and pears uneven; berries plentiful, except cranberries uncertain; tobacco good, topping progressing; corn making rapid growth, large crop.

Week ending August 8.—New England. Boston: Weather favorable for crop growth, but unfavorable for harvesting; rain greatly needed in Maine and parts of New Hampshire; corn and small grain good; rye secured: oats being harvested; hay good, much still outstanding: apples average or above, making good growth; berries abundant, other fruit uneven; potatoes promising; gardens and truck abundant; tobacco very good, topping about finished, cutting will begin in ten days.

Week ending August 15.—New England. Boston: Weather favorable for growth, but unfavorable for harvesting; rain needed in some northern sections; much hay yet uncut in north, crop generally large and quality good; corn small, grain good; potatoes very good, also other vegetables, except onions, which are much below average; apples good, except in parts of Rhode Island and Connecticut, less dropping reported; pears, plums and peaches uneven: berries plentiful; excellent outlook for tobacco.

Week ending August 22.—New England. Boston: Weather favorable for crop growth and harvesting; corn good; oats, rye and grass harvested, good crops: buckwheat in good condition; high winds damaged apples somewhat, but crop will be good and of excellent quality; other fruits uneven and below average; potatoes and vine crops good: tobacco excellent, cutting progressing well.

WEATHER OF AUGUST, 1904.

The month opened with several days of warm, showery weather with muggy, oppressive atmosphere, the conditions that are frequently experienced during August, popularly known as "dog-day" weather. A week of cool weather, with scattered showers followed, prevailing from the 8th to the 14th, during which the day temperatures rose but little above the 80s and the minima fell to the 50s. During the remainder of the month the weather was marked by periods of a few warm days, with temperatures near the seasonal alternating with like periods of cool weather with the mercury considerably below the average. The general outcome as regards the temperature was a monthly mean considerably

below the normal for August. The most noticeable cool spells were those of the 19th and 20th and the 23d and 24th, during which light frosts occurred in many localities. The precipitation during August was below the average, the deficiency ranging from 20 to 30 per cent below the monthly normal. It was, however, quite equably distributed, in the form of showers, through the period and over the territory, and the results were that there was little complaint of the dry weather. The sunshine and cloudiness were also well distributed and there was little out of the usual in these elements. Local storms were somewhat less frequent than usual and with slight exceptions they were less violent than many that have occurred in August of other years. Viewing the weather of the month as a whole it was very pleasant, and it was notable for a marked deficiency in hot, humid days such as are frequently characteristic of August.

In our circular to correspondents returnable August 22 the following questions were asked : —

1. What is the condition of Indian corn?
2. What is the prospect for rowen, as compared with a normal crop?
3. What is the prospect for late potatoes, and have you noticed blight or rot?
4. How do the acreage and condition of tobacco compare with former years?
5. What is the prospect for apples, pears, peaches, grapes and cranberries?
6. What is the condition of pasturage in your vicinity?
7. How have oats and barley compared with former years?

Returns were received from 164 correspondents, from which the following summary has been made : —

INDIAN CORN.

Indian corn is still reported to be somewhat backward and uneven, but is earing well and unless killing frosts come at an unusually early date it should mature a good crop. Were it not for the somewhat uneven stand, caused by poor germination of the seed, and in some cases damage by excessive

moisture during the growing season, the crop would be an unusually heavy one. The growth of stover is reported as luxuriant, even where there are complaints that it is not earing out well. Corn planted for the silo promises an unusually heavy yield.

ROWEN.

Frequent rains have kept rowen growing well and if it were not that the first crop on many fields was secured unusually late the yield of rowen would be one of the largest ever secured. As it is more than an average crop will be secured. Cutting has begun in some sections, particularly on fields where the first crop was secured early, but is by no means general as yet.

LATE POTATOES.

Late potatoes are somewhat backward, and but few had been harvested at the time of making returns. The vines were generally reported as very heavy, but some fears were expressed that tubers would be few in the hill and the crop not as large as previously indicated. Blight had appeared in the western and central sections of the State, though not generally, and there were a few complaints of rot in these sections. In the counties of Bristol, Plymouth and Barnstable, blight may be said to have been reported to be general, with numerous reports of rot. Should these diseases develop with their usual severity only a light crop can be looked for in these counties.

TOBACCO.

There is little change in the acreage of tobacco from the past few years. At time of making returns cutting was beginning and by the close of the month the bulk of the crop will be secured. It is reported to be a heavy crop, with a broad, fine leaf, very free from insect damage, and in short one of the finest crops at time of going to the barns that has ever been secured.

PASTURAGE.

The frequent rains have kept feed in pastures green and growing in almost all sections and seldom have they been reported in such good condition at this season of the year.

FRUITS.

Apples will hardly give a crop up to the average of the "apple year," as it is in most sections, but the quality of the fruit, as indicated by present reports, promises to be excellent. Pears are giving only a light crop, less perhaps than has been previously indicated. Plums have generally yielded well, particularly the Japanese varieties. Peaches are almost a failure, taking the State as a whole, few sections reporting even fair yields. Grapes promise a fair to good crop if frost does not come earlier than usual. Cranberries suffered from late spring frosts, hail, and insect damage and promise but a light crop in the sections of principal production.

OATS AND BARLEY.

Oats are a very good crop, but there are some reports of damage from rains at time of harvesting. Barley is little raised except as a forage crop, to feed green or for the silo. Oats are used for hay to a considerable extent. In these latter capacities both crops have done unusually well.

NOTES OF CORRESPONDENTS.

(Returned to us August 22.)

BERKSHIRE COUNTY.

Mount Washington (H. M. WEAVER). — Indian corn is above the average in condition. The prospect for rowen is good, as compared with a normal crop. Late potatoes are very promising; no blight or rot. Tobacco is not raised in this vicinity. Early apples are a good crop, also cranberries; no peaches or grapes. Pasturage is in excellent condition. Oats are above an average crop; no barley raised.

Monterey (WM. S. BIDWELL). — Indian corn is in good condition but is backward. The rowen crop will be below the normal. The prospect for late potatoes is good and I have seen no blight or rot. Apples are very plenty; other fruits scarce. Pastures are in good condition. Oats are a good crop; no barley raised.

Becket (WM. H. SNOW). — Indian corn shows a good growth of fodder, but the grain is late in maturing. The prospect for the rowen crop is very good. Late potatoes look well, but there is some complaint of rot. No tobacco raised of any amount. There is a good crop of fruit. Pasturage is in very good condition. Oats and barley are average crops.

Stockbridge (F. A. PALMER). — Corn is growing fast, but is mostly late with poor spots in all fields, owing in part to poor seed. Rowen is up to a full normal crop. There is a fine prospect for potatoes, with no blight or rot as yet. Apples are an extra crop and pears a fair crop. Pasturage is in extra good condition. Oats are more than an average crop. Buckwheat looks finely. All crops are doing nicely, stock has plenty of feed and fruits are maturing well.

Washington (E. H. SNOW). — Indian corn is a full crop, better than for the last two years. There will be an average crop of rowen. Late potatoes are a good crop and there is no blight. Apples promise about an average yield; no other fruits raised for market. Pastures are in good condition, owing to the wet weather. Oats and barley are about average crops.

Hancock (C. H. WELLS). — There will be a fine crop of Indian corn. The weather has been almost too dry for a good crop of

rowen. Potatoes are looking fairly well, with very little blight at present. Apples and pears promise well; no peaches or cranberries. Pastures have been rather short, but recent rains have improved them considerably. Oats are a better crop than last year; barley little raised.

Dalton (WESLEY B. BARTON). — Corn is a fair crop, though some of that planted late failed to come up well. There will be a good crop of rowen. Potatoes promise well; some blight but no rot reported. Apples are 70 per cent of a full crop and pears 40 per cent. Pasturage is in very good condition. Oats and barley are full average crops. Taken as a whole the season has been a favorable one.

Windsor (H. A. FORD). — There will be a good crop of corn if frost holds off for three weeks longer. The prospect is good for the rowen crop, better than in former years. Blight has appeared on potatoes and some rot. There will be a great crop of apples. Pasturage is in extra good condition. Oats and barley are fully equal to the crops of former years.

Savoy (W. W. BURNETT). — Indian corn is very backward and in poor condition, with a small acreage. The prospect now is for much less than an average crop of rowen. The prospect for potatoes is now very good, with no blight as yet. Apples are about a normal crop; other fruits not much grown. The continued drought has dried up pasturage. Oats and barley are full average crops as compared with former years.

Williamstown (S. A. HICKOX). — Corn is a good crop, but is ten days late at present. Potatoes look well; blight begins to appear, but no rot as yet. Rowen is about 70 per cent of a normal crop. Apples are a full crop in some orchards, below in others; pears half a crop. Pastures are in good condition, late rains having much improved them. Oats are a full crop.

FRANKLIN COUNTY.

Hawley (C. C. FULLER.) — Indian corn is a good crop. The prospect is good for the rowen crop. Late potatoes promise well with no blight or rot. Apples are a good crop in quantity and quality; pears and grapes fair; no peaches and cranberries grown. Pasturage is in good condition. Oats and barley are only raised for fodder, but are heavier than usual.

Ashfield (CHARLES HOWES). — Indian corn has made a good growth, but is ten days late. Rowen will give more than an average crop. Potatoes promise well and the tops are looking all right, with no blight or rot. Apples are about an average crop;

plums in abundance; pears and peaches few. Pasturage is in very good condition for the time of year. Oats and barley have made a good average yield. The frequent showers have kept crops growing well.

Shelburne (GEO. E. TAYLOR). — Corn is looking finely, but is perhaps a little backward. More than an average crop of rowen may be expected. A large yield of potatoes is promised; a little rot has appeared. Apples are less than a normal crop; pears and peaches light. Pasturage is in good condition with plenty of feed. Oats and barley are not raised to any amount.

Leyden (U. T. DARLING). — Corn is looking well, but is a little late. The prospect for rowen is good and more than a normal crop will be secured. The prospect for potatoes is good, with no blight or rot as yet. There is an average crop of apples, pears and grapes; no peaches or cranberries. Pastures are in good condition. Oats and barley are fully up to the average of former years.

Deerfield (H. A. WELLS). — Corn is earing out heavily. Rowen will be less than a normal crop, though early cut fields look well, — less clover than usual. Late potatoes look well and the vines are keeping green; no rot noticed. There is a slightly decreased acreage of tobacco, but the condition of the crop is above the average. The prospect is good for the apple crop; pears and grapes plenty; no peaches. Local rains have kept feed in pastures good. Oats are a heavy crop; no barley raised for grain. Some few growers have commenced tobacco harvest.

Whately (FRANK DICKINSON). — Indian corn is in good condition. Rowen is less than an average crop and most of it is late. Potatoes should give an average crop, with no blight or rot as yet. Acreage of tobacco large and quality of the crop fine. There will be a light crop of apples. Pasturage is in good condition. Oats are a heavy crop but badly lodged.

Sunderland (J. M. J. LEGATE). — Corn is late but is looking splendidly, and if frost holds off there will be a heavy yield. The rowen crop promises to be far above the average. Potatoes appear to be few in the hill, but no blight or rot has appeared, so the crop should be an average one. There is about the usual acreage of tobacco and at this time as good a crop as has been grown in years, a perfect leaf with no damage from insects. Apples will be an average crop; few other fruits grown. Pasturage was never better at this season of the year. All crops are far above the average in quantity and quality at this date.

Leverett (W. L. BUTWELL). — Indian corn is in good condition. There will be a normal crop of rowen. The prospect for late pota-

toes is very good ; have noticed neither blight nor rot. The tobacco crop is the best for three years. There will be excellent yields of all fruits. Pastures are in good condition. Oats and barley are about average crops as compared with former years.

Erving (CHAS. F. CLARK). — Corn is in good condition. There will be a good crop of rowen. Late potatoes promise a good crop, but there is some rot. There is scarcely any tobacco raised here. There will be an average yield of all fruits except peaches ; cranberries little raised. Pasturage is in good condition. Oats and barley are about average crops as compared with former years.

New Salem (DANIEL BALLARD). — Indian corn is making a fine growth but is backward. I think the rowen crop will be above the normal. Late potatoes are looking finely, with but little blight or rot. There will be a good crop of apples on high ground ; grapes and pears plenty. Pasturage is in quite good condition. Oats and barley are fully up to the normal in yield.

North Orange (A. C. WHITE). — A large part of the corn raised in this section is used for ensilage ; prospect for the crop normal. Rowen will be more than a normal crop. There is a fair yield of potatoes of good quality with no blight or rot. Apples, pears and plums will give good yields. Oats and barley are about average crops.

HAMPSHIRE COUNTY.

Ware (J. H. FLETCHER). — Indian corn did not germinate well, but looks well now. The prospect is that rowen will be a normal crop. The prospect for late potatoes is good and I have noticed neither blight nor rot. There will be a good crop of all kinds of fruit. Pasturage is in fair condition. There will be a normal crop of oats and barley, compared with former years.

Greenwich (WM. S. DOUGLAS). — Corn is rather backward. There will be a good crop of rowen. Late potatoes promise well and there is neither blight nor rot. There will be a good crop of all kinds of fruit. Pasturage is getting dry. Oats and barley are fair crops as compared with former years.

Enfield (D. O. CHICKERING). — Indian corn is in fair condition but is somewhat late. There is good promise of more than a normal crop of rowen. The prospect for late potatoes is very good, with no blight or rot as yet. There will be a heavy crop of apples of all kinds except Baldwins ; pears and grapes good ; no peaches. Pasturage is in fine condition for the time of year. Oats and barley are about average crops so far as noted.

Northampton (H. C. COMINS). — Indian corn is in excellent condition. The rowen crop is looking finely. The outlook for

potatoes is good, with very little blight. The acreage of tobacco is about the same as in former years and there is an excellent crop. There is about 75 per cent of the normal crop of apples; 50 per cent of pears; no peaches or cranberries; grapes good. Pastures are in very good condition, and late rains have kept the feed good. Oats are a very good crop; little barley raised. There has been no damage by wind, rain or drought thus far during the season. Tobacco and onions, the leading crops, are unusually good.

Southampton (C. B. LYMAN). — Corn has made a good growth of stalk and is fairly well eared out, and though a little late and thin will come out all right. Rowen promises to be the largest crop for several years. Acreage of tobacco about the same as usual and condition never better. Apples and grapes will give fair crops of good fruit; very few pears; no peaches. The yield of late potatoes promises to be good and there is little blight and no rot. The frequent rains have kept the pastures in good condition. Oats are cut for fodder and barley not much grown.

Westhampton (H. A. PARSONS). — Indian corn is in good condition. There will be a full normal crop of rowen. Potatoes promise to give an average yield. Apples will give about a three-fourths crop; no peaches; pears half a crop. Pasturage is in good condition. Oats and barley are not grown hereabouts.

Williamsburg (F. C. RICHARDS). — Corn has developed rapidly the last three weeks and is now looking well. Rowen promises to give a heavy yield. Late potatoes are looking well and there is but little blight as yet. The acreage of tobacco is about the same as usual, and it is above the average in condition. Apples, peaches and grapes will give good crops of fine quality; but few peaches. Pasturage is holding out well. Oats are a good crop; but little barley raised.

Chesterfield (HORATIO BISBEE). — Indian corn is backward but shows a good growth. There will be a good crop of rowen. The potato crop bids fair to be a good one; have noticed neither blight nor rot. Apples are looking well and are very forward in size and color. There is plenty of feed in the pastures and stock is looking well. All sowed grains have made good growth and are mostly cut for fodder. We have had such frequent rains that the country never looked better than at the present time.

Worthington (C. K. BREWSTER). — Indian corn is looking fairly well though rather backward. There will be more than a normal crop of rowen. Late potatoes promise a good crop and no blight or rot has yet appeared. There will be a good crop of apples and pears; but few grapes and cranberries raised. Pastures are in very good condition. Oats and barley are about average crops.

HAMPDEN COUNTY.

Chester (C. Z. INZELL). — Indian corn is late and backward. There will be a good crop of rowen. Potatoes promise a good crop; have noticed neither blight nor rot. Apples will give a good crop, as will also other fruits so far as grown. Pastures are in good condition. Oats and barley are about average crops, as compared with former years.

Tolland (EUGENE M. MOORE). — Corn is about ten days late. The prospect for rowen is better than usual, as we have had plenty of rain. There is some blight on potatoes and they have also commenced to rot. Apples, grapes and cranberries are abundant. Feed in pastures is about up to the average. Oats and barley are about normal crops.

Westfield (C. F. FOWLER). — Corn has made heavy growth, but is rather late and an early frost would be disastrous. The prospect for rowen is fairly good. Potatoes run heavily to vines and the yield is above the average, with but little blight and no rot at present. The acreage of tobacco is ten per cent or more less than last year, but its condition the best for years. Apples are a full crop; pears light; no peaches; grapes good. Pasturage is holding out well and cattle are in good condition. Oats were a heavy crop. Hail damaged quite a section of the tobacco acreage, cutting a well defined strip several miles wide through a part of Southwick, Suffield, Ct., Agawam and Westfield, entailing heavy loss to the growers that were hit.

Agawam (J. G. BURT). — Indian corn is in good condition. There will be a good crop of rowen. The prospect for the potato crop is good and there is no blight or rot as yet. Tobacco is about normal in both acreage and condition. There is a good prospect for all kinds of fruit. Pasturage is in good condition. Oats and barley are better crops than those of former years.

West Springfield (N. T. SMITH). — Corn gives promise of an average crop if the season is long enough to ripen it. Rowen will give a good crop on early mown fields. Potatoes give a good yield of fine quality; some blight but no rot. Tobacco has made a fine growth and promises a crop of good quality. Apples are a smaller crop than last year; some pears; no peaches; grapes good. Pasturage is above normal in condition for the time of year. Oats and barley show a good growth of straw, but are raised for hay and much of it was injured by unfavorable weather. Timely rains have kept all vegetables in fine growing condition. Chestnut trees were never as heavily loaded with burrs as this year.

Chicopee (R. W. BEMIS). — Indian corn is in good condition.

Rowen will be a good normal crop this year. The prospect for late potatoes is quite good, with no blight or rot as yet. Tobacco promises to be a full average crop. Apples are plenty this year. Pasturage has been good, but is now a little short. Oats are looking well.

East Longmeadow (JOHN L. DAVIS). — Corn promises well except that a good many fields are uneven on account of having been planted over. Rowen is only a fair crop as most farmers were late in securing the first crop. Late potatoes have set very poorly on dry ground. Apples are a fair crop; no peaches; grapes plenty. Pastures are now in need of rain. Oats and barley are average crops. Grain is so high that farmers find little profit from cows.

Wilbraham (HENRY M. BLISS). — The late rains have been very beneficial to corn and grass, and both Indian corn and rowen promise normal crops. Potatoes make but a small yield and show some blight. The apple crop is good; peaches very light; plums a full average; pears fair; grapes and cranberries average. Pasturage is in good condition. Oats and barley are about average crops, as compared with other years.

Palmer (O. P. ALLEN). — Indian corn is in good condition for a backward season. The prospect for rowen is favorable on account of recent rains. The prospect is good for late potatoes and neither blight nor rot have appeared. Tobacco is not raised in this part of the county. The yield of fruit will be better than usual, excepting peaches, of which there are none. Pastures are in good condition for the time of year. Oats and barley are quite up to average crops.

Brimfield (C. S. TARBELL). — Indian corn is in good condition. Rowen will give a good crop on early cut fields. There is a good yield of late potatoes, but some indications of rot. The prospect is good for apples, pears, peaches and grapes. Pasturage is in very good condition.

WORCESTER COUNTY.

Spencer (H. H. KINGSBURY). — Indian corn is making a fine growth and is in seasonable condition. Favorable weather has produced a crop of rowen well up to the average. Potato vines are in unusually thrifty condition with no signs of either blight or rot. Fruits, with the exception of peaches, promise abundant yields. The many cloudy days and showers have kept pasturage in fine condition. Oats and barley are generally cut for hay and were up to the average.

North Brookfield (JOHN H. LANE). — Corn has made a strong growth, but it is feared that the grain will be short. There will be a good crop of rowen. There is little blight and no rot on potatoes and the prospect for the crop is good. Apples and pears will give less than half crops; grapes and cranberries full crops. Pasturage is in extra good condition. Oats and barley are mostly cut for fodder and have done very well.

Barre (JOHN L. SMITH). — Indian corn is in very good condition. The rowen crop will be above the normal and would have been even heavier if the first crop had not been cut late. The prospect is good for late potatoes with no signs of blight or rot. Apples are a good crop of good sized and smooth fruit. Pasturage is in extra good condition. Oats are a heavy crop; no barley raised.

Petersham (D. F. BIGELOW). — Corn never looked better. The rowen crop is good on early cut fields. Potatoes promise a good crop with no blight as yet. Apples are a two-thirds crop; pears and grapes full crops. Pastures are in good condition for the time of year. Oats and barley are good crops.

Dana (LYMAN RANDALL). — Corn is looking well and is well eared. The rowen crop is good where the first crop was cut in season. The prospect for late potatoes is good; have noticed neither blight nor rot. Apples will be a fair crop with the exception of Baldwins; pears and grapes large crops. Pastures are in better condition than is usual at this time. Oats and barley are fully up to the average of former years. Where corn had to be replanted it still needs two or three weeks of good weather to mature it.

Royalston (C. A. STIMSON). — Indian corn is late but looks to be a full crop. Rowen promises to be a fine crop. The prospect for potatoes is good save that blight has appeared. There will be good yields of all kinds of fruit. Pasturage is in fine condition. Oats and barley are full average crops.

Gardner (A. F. JOHNSON). — Corn is late but is growing nicely and indicates a good crop. There will be an average crop of rowen. Late potatoes are looking well with no blight. There will be 60 per cent of a full crop of apples; pears promise well. Pasturage is short and in need of rain. There was a slight frost here on the morning of August 19.

Ashburnham (E. D. GIBSON). — Indian corn is very backward and needs a great deal of warm, sunshiny weather. Rowen will be about an average crop. It is too early to judge the yield of potatoes; vines have made a great growth, but many think the yield of tubers will not be in proportion; blight begins to show,

but not badly. There are few winter apples; pears a fair crop; peaches and grapes good; cranberries few. Pasturage is in fair condition. Oats and barley are in good condition. Japanese millet has proved a grand crop this year, although some did not put in any because it was such a failure last year.

Lancaster (S. C. DAMON). — Indian corn is a good crop but late. The prospect for the rowen crop is good. Late potatoes promise well with no blight as yet. There will be a large crop of apples, pears and grapes. Pastures are in good condition. Oats and barley are good crops.

Bolton (H. F. HAYNES). — Corn is a good crop but there is little of it, as it came up so poorly that it was replanted to fodder crops. Rowen will be a full crop. Potatoes are very backward, but show no rot as yet. Apples are a good crop; pears scarce; no peaches; grapes good. Pastures are in good condition. Oats and barley are full crops. All crops run to vine and potatoes cover the ground, but I think the crop will be light. The hay crop was very heavy, 25 per cent above the average.

Northborough (JOHN K. MILLS). — Corn is coming along nicely. There will be a good crop of rowen. The prospect for late potatoes is good, but there is some blight. There will be good yields of apples, pears and grapes. Pasturage is very good for this time of year. Oats and barley have been average crops.

Worcester (SILAS A. BURGESS). — Indian corn is in good condition. The prospect for rowen is good, as compared with a normal crop. There will be a fair crop of potatoes and neither blight nor rot have appeared. Winter apples are not so large a crop as was expected; other fruits fair. Pasturage is in fair condition. Oats and barley are good crops.

Shrewsbury (FRED J. REED). — There is prospect of a large yield of corn. Rowen is a very good crop. Late potatoes are looking well, with no rot as yet. Fall apples are a good crop, but winter apples are light; pears and peaches not very plentiful; grapes and cranberries not raised. Pasturage is in very good condition. Oats and barley look very well.

Southborough (E. F. COLLINS). — Indian corn is very good, though somewhat late. Rowen will be 50 per cent more than an average crop. There is a good crop of potatoes, with the vines nearly all dried down and no rot. There will be half a crop of apples; pears good; few peaches. Pasturage is in excellent condition for the time of year.

Sutton (C. P. KING). — Indian corn is backward but is looking well. The prospect is that rowen will be a light crop. Some blight and rot has been noticed on potatoes. There will be a light crop

of all kinds of fruit. Pasturage is in good condition in this vicinity. Oats and barley are better crops than are usually obtained.

Milford (JOHN J. O'SULLIVAN). — Corn is in good condition. Rowen promises to be an average crop. The prospect is good for late potatoes, though blight is beginning to appear. Apples and pears are good crops; peaches poor; grapes and cranberries fair. Pasturage is in average condition for the time of year. Oats and barley are about average crops, as compared with former years.

Blackstone (O. F. FULLER). — Indian corn is in good condition. There will not be as large a crop of rowen as last year. Potatoes are not yielding as well as usual. There is a fair crop of apples; no peaches; few grapes; cranberries a good crop. Pasturage is getting very short in this vicinity. Oats and barley are not up to the average of former years in yield.

MIDDLESEX COUNTY.

Framingham (J. S. WILLIAMS). — The weather conditions have been very satisfactory for the growth of corn and a good crop will be put into the silos. The rowen crop will be above the average, but good hay weather is needed to secure it. Potatoes give large tubers but are few in the hill; no blight or rot as yet. The prospect for winter apples is good; pears and grapes fair; peaches a failure. Pasturage has improved during the month and promises good feed. Oats and barley are raised for forage, barley principally as a soiling crop, and have given good results.

Marlborough (E. D. HOWE). — Indian corn is fully up to the average in condition. Rowen promises to give a good crop. The prospect for late potatoes is good, with no blight or rot as yet. Apples promise three-fourths of an average crop; pears half a crop; peaches 10 per cent of a crop; grapes 100 per cent. Pasturage is as good as ever at this time of the year. Oats and barley are not grown except for fodder.

Stow (GEO. W. BRADLEY). Indian corn is in about the usual condition for the time of year. Rowen looks well on fields where the first crop was cut early. Late potatoes are looking well, with no signs of blight or rot. Apples promise a heavy crop; pears good; other fruits scarce. Pasturage is not in as good condition as a month ago. Oats and barley are about average crops. Squashes are looking finely.

Maynard (L. H. MAYNARD). — Indian corn is little raised for grain, being mostly put into the silo and fed green. The rowen crop promises to be heavy, far above the normal. Potatoes promise well, the vines never looking better; no blight nor rot reported

as yet. Early apples are plenty, but Baldwins will be short; no peaches; pears, grapes and cranberries in abundance. Pasturage is in very good condition, above the normal. Oats and barley are grown for fodder and were good crops. Hungarian grass and millet are grown as forage crops and were exceptionally good.

Westford (J. W. FLETCHER). — Indian corn is in good condition, but is mostly used for silage. Rowen is rather better than an average crop. Late potatoes promise well, with no blight or rot as yet. Fall and early apples are very plentiful, but winter apples are a little shy in yield. Pasturage is in very good condition.

Townsend (G. A. WILDER). — Indian corn is in good condition. Rowen will be above a normal crop. There is a good yield of potatoes and they are very free from blight and rot. Apples promise a good crop; pears fair; peaches light; grapes fair; cranberries good. Pasturage is in very good condition. Oats and barley are about normal crops.

Pepperell (FRANK W. AMES). — Corn is looking well but is about two weeks late. The prospect is that rowen will be more than an average crop. Late potatoes are looking finely; have noticed neither blight nor rot. Apples and pears are full crops; peaches half a crop; grapes a full crop. Pastures have held out well and are in good condition at present. Oats and barley are very heavy crops and will mostly be used for fodder.

Tewksbury (G. E. CROSBY). — Indian corn is in good condition. The prospect is that rowen will be better than a normal crop. Blight and rot are badly in evidence on some fields of potatoes. Apples and pears are abundant, but there are no peaches. Pasturage is in good condition for the time of year. Oats and barley have been good as fodder crops.

Billerica (GEO. P. GREENWOOD). — Indian corn is in good condition. There will be a heavy crop of rowen. The yield of potatoes seems to be rather light, but as yet there are no signs of blight. Apples are half a crop and pears one-third of a full crop; some peaches; grapes plenty; cranberries a fair crop. Pasturage is in good condition.

Concord (WM. H. HUNT). — Corn is looking very well now. The prospect now is for a fine crop of rowen. The potato crop is good and I have not seen blight or rot so far. Apples are not a full crop; pears light; grapes average. Pasturage is in good condition owing to frequent showers. Oats and barley are average crops.

Wakefield (CHARLES TALBOT). — Corn has made a very good growth, but is about two weeks later than usual. Rowen is ten

per cent ahead of last year in yield. The promise is good for late potatoes, with no blight or rot as yet. In some sections apples are abundant; pears plenty; peaches a failure; cranberries an abundant crop. Pasturage is in very good condition. Oats and barley are about average crops as compared with former years. Cabbages never looked better and there is a large acreage. All crops are a little later than usual.

Winchester (S. S. SYMMES). — Indian corn is not raised. Rowen will be better than an average crop. The prospect for late potatoes is good, with no blight or rot. Apples and pears are about half crops. Pasturage is in fine condition. Recent rains have given the grass a good start for the second crop. Some peaches are rough and small and will be good for nothing; parts of some orchards are fair and will make a good crop. Pears are not nearly as heavy a crop as usual.

Arlington (W. W. RAWSON). — The condition of the onion crop is very poor and not over half a crop will be secured. Celery looks finely, but is not large for the time of year, continued rains will improve it very much. Tomatoes look well.

Weston (H. L. BROWN). — Not much Indian corn is raised in this locality. The prospect is that rowen will be much less than a normal crop, owing to dry weather. Late potatoes promise a good yield and I have not noticed blight or rot. There will be a fair crop of apples and pears; no peaches; few grapes; no cranberries. Pasturage is getting dry and short. Oats and barley are used as forage crops only and have been good.

ESSEX COUNTY.

Amesbury (F. W. SARGENT). — Indian corn is in fair to good condition. Rowen will give a good crop where the first crop was cut early. There is a good prospect for late potatoes and no blight is noticeable. Apples and pears are full crops; no peaches; plenty of grapes. Pasturage is in very good condition. Oats and barley are little grown except for cutting green. The season is a generally productive one, with less of the usual drawbacks to the farmer than we generally have.

Haverhill (EBEN WEBSTER). — Indian corn is in good condition. Rowen will be about a normal crop. The prospect for late potatoes is good and I have noticed neither blight nor rot. Apples are a good crop; pears medium; peaches none; grapes plenty. Pasturage is in as good condition as is usual at the time of year.

North Andover (PETER HOLT). — Corn is in good condition and bids fair to be a heavy crop. Rowen is light except on very

early cut fields. Potatoes are a good crop, but blight and rot have both appeared. There will be a large crop of all early apples and a fair crop of winter varieties; pears and grapes plenty. Fall seeding has begun and the seed comes well. There was a large crop of hay, but much of it was secured in a damaged condition on account of so much dull weather.

Andover (MILO H. GOULD). — Indian corn is rather backward. Rowen will be considerably above an average crop. The prospect is good for late potatoes and neither blight nor rot have appeared. Apples are abundant; pears good; peaches very few; grapes and cranberries good. Pasturage is above the average in condition. Oats and barley compare favorably with the crops of other years.

Rowley (DANIEL H. O'BRIEN). — Corn is in quite good condition and promises well. Rowen will be below an average crop. Late potatoes promise well, but blight is showing in a few places. Apples are a medium crop; pears fair; no peaches; grapes and cranberries light crops. Pastures are in rather poor condition. Oats and barley are about normal crops, when compared with other years.

Topsfield (B. P. PIKE). — Indian corn is looking well, but the acreage is very small. There will be a full average crop of rowen. Late potatoes are looking well and there is no blight as yet. Apples will give a medium crop of good quality. Pastures are in good condition. Oats and barley are only raised for hay and as forage crops. Pears are below an average yield; very few peaches; few grapes and cranberries.

Manchester (JOHN BAKER). — Indian corn is in good condition. Rowen promises to be a good crop. There is some blight on late potatoes, but the prospect for the crop seems good nevertheless. There are fair crops of apples, pears, grapes and cranberries, but no peaches. Pasturage is in good condition. Oats and barley are about average crops as compared with those of former years.

NORFOLK COUNTY.

Stoughton (CHAS. F. CURTIS). — Indian corn has grown very unevenly and is not quite up to the average. Rowen will be a full average crop. Blight has struck some fields of potatoes and the prospect for the late crop is poor unless the Bordeau mixture has been used. Apples will be half a crop; pears very poor; no peaches; grapes three-fourths crop; cranberries almost a failure. Pasturage is as good as any year at this time. Oats and barley are full average crops.

Norwood (F. A. FALES). — Corn is rather late but is looking

well. Rowen is about 50 per cent of a normal crop, as it has been very dry here. Late potatoes are looking well, with no blight or rot as yet. There will be a small crop of apples, pears, peaches, grapes and cranberries. Pastures are drying up rapidly. Oats are about a three-fourths crop and barley an average crop.

Wulpole (EDWARD L. SHEPARD). — Indian corn is late, but if frosts hold off there will be a fair crop. Rowen will be less than a normal crop. The prospect is that the yield of potatoes will be below the average, as there is some blight and rot. Apples, pears and grapes are fair crops; no peaches; cranberries a light crop. Pastures are in fair condition considering the dry weather. Oats and barley are a little above the average of former years.

Millis (E. F. RICHARDSON). — Corn is a little backward and suffering from drought. There will be a very fair crop of rowen. Late potatoes promise a good crop, with no blight or rot as yet. Apples are a good crop; pears and grapes fair; peaches and cranberries poor. Feed in pastures is becoming rather short. Oats and barley are good crops this year.

Franklin (C. M. ALLEN). — Indian corn is late but promises a good normal crop. Rowen will be fully a normal crop. Potatoes promise a good crop, with neither blight nor rot as yet. Apples are a good crop; pears few; peaches none; grapes few; cranberries light. Pasturage is in very good condition, better than usual. Oats and barley are average crops, as compared with former years.

BRISTOL COUNTY.

Easton (H. M. THOMPSON). — Indian corn is in very good condition. Rowen is looking unusually well. Blight has struck and damaged potatoes to some extent. Apples, pears and peaches are not large crops; grapes and cranberries promise well. Pasturage is in fair condition. Oats and barley compare favorably with other years. Squab raising appears to be on the increase.

Mansfield (WM. C. WINTER). — Indian corn is somewhat late and uneven but promises a fair crop. The rowen crop will be above the average, from present indications. The prospect for potatoes is excellent and no blight has been reported thus far. Apples are a poor crop, winter varieties having been damaged by high winds; pears and grapes medium; no peaches; cranberries a small crop. Pasturage is in excellent condition. Oats and barley are little grown, but are excellent crops.

Norton (WM. A. LANE). — Corn is in very good condition. The prospect is that rowen will be about an average crop. Blight is general on potatoes, but I have noticed no rot. There will be

about half a crop of apples. Pasturage is in very good condition. Oats and barley are about average crops, compared with former years.

Dighton (JAMES N. PAUL). — Indian corn is in good condition. Rowen will be a good crop. Not many potatoes are grown here, but they have blighted and show some rot. No apples; pears poor; no peaches; grapes good; cranberries not grown. Pasturage is in good condition. Oats and barley are not grown here. Strawberry plants have made a good growth for another year and the acreage is somewhat increased. Tomatoes promise to be a large crop, but need plenty of sunshine.

Swansea (F. G. ARNOLD). — Indian corn is in very good condition. There is prospect of a good crop of rowen, one above the average. Late potatoes promised a heavy crop, but blight and rot set in on the 13th to 15th. No apples, pears or peaches; grapes plenty; cranberries not grown. Pastures are in very good condition. Oats and barley are grown principally for feed and cut green.

Dartmouth (L. T. DAVIS). — Corn is gaining very rapidly in condition. Some fields of rowen promise very well, but those late cut do not promise as well. Apples are a two-thirds crop; pears less than half a crop; grapes fair. Pasturage continues in very fair condition. Oats and barley are perhaps slightly above average crops. Potatoes have made a fine growth, but some fields show signs of blight and there is complaint of rot.

Westport (ALBERT S. SHERMAN). — Indian corn is a good crop and on most fields very heavy. Rowen promises to be a very good crop. Potatoes promise a large yield, but there is some rot. Apples and pears are fair crops; no peaches; grapes abundant; not many cranberries grown. Pasturage never was better, plenty of rain makes good feed. Oats are not an average crop and many fields have rusted. Cabbages and turnips are doing well. Grain has been injured by rain and harvesting has been delayed. Apples and pears have fallen badly.

PLYMOUTH COUNTY.

Norwell (H. A. TURNER). — Indian corn is in good condition but is a little late. Rowen is about a normal crop. The prospect for late potatoes is good and I have noticed very little blight. The prospect is good for apples, grapes and cranberries. Pastures are in very good condition, but the high lands need rain. Oats and barley are about normal crops.

West Bridgewater (CLINTON T. HOWARD). — Corn is looking

very well though many fields had to be planted over twice. On fields where the first crop of hay was cut early there is a heavy crop of rowen. There is a large area of potatoes planted and those which are being dug now yield heavily; no blight as yet. There will be a very small crop of fruit, but cranberries are plenty. Pastures are in good condition. Barley, Hungarian grass and corn are raised to feed green and are growing finely.

Pembroke (NATHANIEL MORTON). — Indian corn is in good condition. There will be more than a normal crop of rowen. The prospect for potatoes is good, with no blight or rot as yet. Fruit of all kinds is poor in quality and light in yield; cranberries are about half a crop, having been much injured by hail. Pasturage is in good condition. Oats and barley are but little raised.

Duxbury (R. T. RANDALL). — Corn is in good condition. Rowen is a better crop than in former years. There is some blight on potatoes. Apples and other fruits are not very plenty here; grapes and cranberries plenty. Pasturage is in very good condition. Oats and barley are more than average crops. Leaves on trees are turning yellow and falling off.

Halifax (G. W. HAYWARD). — Where corn came up well it looks a heavy crop, but there are many missing hills. The prospect for rowen is very good. Late potatoes look finely; some blight but not bad as yet and no rot as yet. There are not many apples nor pears and no peaches; some grapes and cranberries. Pastures are in good condition. Oats and barley are only raised for fodder and have yielded good crops.

Lakeville (NATHANIEL G. STAPLES). — Indian corn is in good condition. The prospect is that the rowen crop will be a little better than a normal crop. The prospect for late potatoes is very good; some blight but no rot as yet. There will be a fair crop of apples and pears; no peaches; grapes and cranberries good. Pastures are in very good condition. Oats and barley are very good crops.

Carver (J. A. VAUGHAN). — Indian corn is in good condition. Rowen promises to give a good crop. Late potatoes are growing fast and there has been no blight or rot. There are no peaches. Pastures are in good condition. Cranberries are our main crop. Many bogs winterkilled badly; the frost in June destroyed many blossoms, and fruit worms are now working to some extent, but on the whole we expect an average crop.

Rochester (GEO. H. RANDALL). — Corn has grown well and will mature a good crop if frost holds off. Rowen will be a very good crop, as the frequent rains have kept grass growing. Late potatoes will not give a very good crop as blight and rot have appeared.

All fruits are below average yields except grapes, which are better than usual. Pasturage is in very good condition for the time of year. Oats and barley are more than average crops.

BARNSTABLE COUNTY.

Falmouth (D. R. WICKS). — Corn is fully up to the average in growth and is looking finely. Rowen is or bids fair to be a good crop. Potatoes are rotting on heavy land, largely because of the wet weather. Apples are a very good crop; peaches and plums are rotting; pears small and scaly. Pastures are in fine condition as the continued wet weather keeps the feed growing. Oats and barley are little grown except for fodder.

Barnstable (JOHN BURSLEY). — On warm land Indian corn is in very good condition, but on cold or wet land very poor. The rowen crop will be very large and farmers are cutting when the weather allows. The prospect for late potatoes is good, with very little blight. Apples, pears and peaches are very light; grapes good; cranberries a small to fair crop. Pasturage is in good condition. Oats made good growth, but the weather has been very poor for harvesting them. The prospect for the cranberry crop seems to lessen, and the fruit worms are now eating badly.

Brewster (THOS. D. SEARS). — Indian corn is in very good condition. The prospect for rowen is very good, owing to the wet season. The prospect for late potatoes is not very good and I have noticed blight and some rot. Fruit is looking fairly well, but there will not be an average crop of cranberries. Pasturage is good owing to the wet weather. There is a normal crop of oats and barley.

Mashpee (W. F. HAMMOND). — Indian corn is above the average in condition. There will be more than an average crop of rowen. Late potatoes promise well and there is neither blight nor rot. Apples, pears and grapes will be half crops; cranberries a two-thirds crop. Pasturage is above the average in condition. Oats turned out well.

Dennis (JOSHUA CROWELL). — Corn is in good condition. Rowen will be a little above the normal in yield. The prospect is fair for late potatoes, although I have noticed some blight. Apples, pears and grapes will give fair crops, but cranberries are less than the average. Pastures are in very good condition. Oats are about a normal crop; no barley grown. Corn looks finely, but needs some hot, dry weather to mature it. The season has been unusually wet so far.

Chatham (E. Z. RYDER). — Indian corn is in very good condi-

tion. Rowen will give more than an average crop. Late potatoes on low land are ruined by blight and rot. The outlook is good for apples, pears and grapes. Pasturage is in better condition than for many years. Oats are not planted to any extent and barley not at all. The cranberry crop promises to be above the average in this section. Some growers are complaining of scalded berries, which will affect the yield somewhat.

Eastham (J. A. CLARK). — Rowen will give a good yield. The prospect for late potatoes is good, though there is some blight. There will be only a light crop of winter apples. Pasturage is in good condition. Asparagus is commencing to rust with the prospect that it will be badly affected, spraying seems to do no good this season.

DUKES COUNTY.

West Tisbury (GEO. HUNT LUCE). — Indian corn is in good condition. Rowen will be more than an average crop. Late potatoes will give but a poor yield and show some rot. The prospect for apples is poor and for cranberries good. Pasturage is in first class condition. Oats and barley are average crops.

NANTUCKET COUNTY.

Nantucket (H. G. WORTH). — Indian corn is a little late, but the prospect for the crop was never better. The outlook is very favorable for a big rowen crop. The prospect for late potatoes is good with no blight or rot. Cranberries are looking well. Pastures are in good condition. There is a full crop of oats.

BULLETIN OF
MASSACHUSETTS BOARD OF AGRICULTURE.

HARVESTING AND MARKETING APPLES.

By F. A. WAUGH, *Professor of Horticulture, Massachusetts Agricultural College.*

The apple tree is peculiarly at home in Massachusetts and New York State. Northward the severe winters make the growing of many varieties precarious, while southward the trees are less and less thrifty, until in the extreme southern States apples are almost as rare as oranges are with us.

The commercial importance of the apple crop in Massachusetts is increasing rapidly from year to year. In general we are seeing more clearly that the more refined lines of agriculture are the ones in which we reap the greatest success, and amongst these fancier crops requiring more intensive culture, the apple takes high rank.

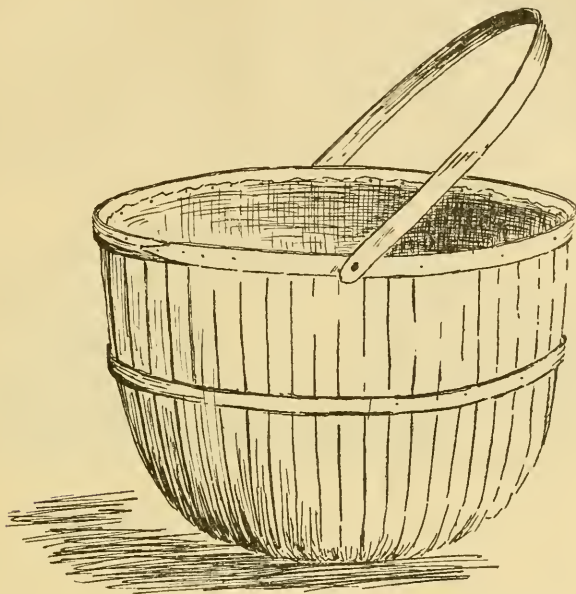
It must be said that the methods of handling the apple crop have been very much changed in recent years. The farmers who still adhere to the old-fashioned way of doing things do not find great encouragement in selling apples. On the other hand, those who have taken up with modern ideas, or better still have led in the establishment of modern practices, are reaping their just and generous reward.

PICKING THE FRUIT.

The time was when the apples used to be shaken off the trees. A still lazier method was to allow them to fall off. Such apples are fit only for second-class cider, and if that was the market to which they were destined, no great damage was done. However, such apples are still sometimes offered in the markets. They are almost always a dead loss to the man who attempts to sell them, and interfere, sometimes seriously, with the sales of good hand-picked fruit. Apples must be hand-picked from the trees in order to be marketable. This is the only way. Moreover, they must be carefully hand-picked and they should be taken off with the stems

attached to the fruit. If the apples are torn off the stems, the skin is ruptured and decay is apt to set in.

The best receptacle in which to pick apples is the oak splint, swinging bale, half bushel basket. If fancy fruit is to be handled, it is worth while to pad these baskets with old grain sacks. A



PICKING BASKET,—OAK SPRINTS, ONE-HALF BUSHEL, SWINGING BAIL.

heavy wire bent in the form of the letter S enables the picker to hang the basket on a limb while it is being filled, and also to let it down by a strap out of the tree.

Picking ladders are usually needed on old trees. These should be long and as light as possible. Step ladders are sometimes used. They should always be of the three-legged variety.

Certain varieties of apples, as for example Wealthy, have the bad habit of falling early from the trees. With such varieties picking has to be timed with reference to this bad habit. Fruit must be picked early enough to prevent its falling. Other varieties which hold on well, like Baldwin and Spy, may be picked when they are at their best. There has been a good deal of argument as to just when an apple should be picked, but recent experiments show that apples which are ripe and fully colored keep better in storage than those which are picked earlier.

This matter of having apples fully grown, ripe, and thoroughly colored is of so much importance that some growers who make a

specialty of fancy fruit have adopted the practice of picking over the tree two or three times. Those apples which are mature and colored are taken off at each picking, while those which are yet green are left. These green apples increase in size rapidly and take on the proper color eventually. The men who have tried this method say that it pays well.

In handling the fruit in the orchard, between the trees and the storage room, or later, between the storage and the shipping station, some suitable wagon ought to be provided. A stone boat is sometimes used and is not the worst thing that could be found, especially for short hauls and small loads. It is better, however, to have one of the low-down wagons made especially for handling



HOME-MADE FRUIT WAGON FOR HANDLING BARRELS.

fruit. In the illustration one is shown as it was actually made up at home. Some sills were hung by strap irons from the front and rear axles of a common wagon frame, and on these some boards were laid, making a floor for carrying the barrels. Handling barrels of apples in and out of the common high wagon is hard and expensive labor, and it is apt to damage the fruit.

GRADING THE FRUIT.

In nothing does the work of the experienced apple seller differ more from that of the inexperienced man than in the grading of the fruit. All of our city markets have now reached a point where fruit can hardly be sold at any price unless it is carefully and uniformly graded and properly marked.

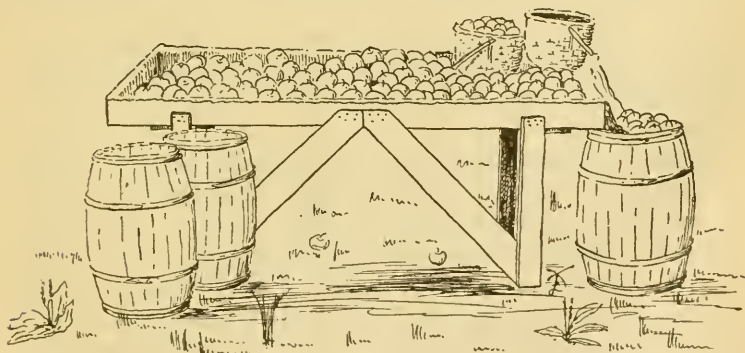
Apples should be graded into at least three lots which we may call firsts, seconds and culls. Sometimes four grades are made, but the three here mentioned are the most usual. The first grade of fruit must be of good size, uniform in shape and color, free from blemishes and true to name. Second grade fruit is smaller, not so well colored, but must be free from any serious blemishes. The National Apple Shippers' Association has adopted a rule for

determining first and second grade apples as follows: "The standard for size for number one apples shall be not less than two and one-half inches in diameter and shall include such varieties as Ben Davis, Wealthy, Twenty-ounce, Baldwin, Greening, and other varieties kindred in size. The standard for such varieties as Romanite, Russet, Winesap, Jonathan, Missouri Pippin and other varieties kindred in size shall not be less than two and one-quarter inches, and further, number one apples shall be at the time of picking practically free from the action of worms, defacement of surface, or broken skin. They shall be hand picked from the tree, a bright and normal color, and shapely in form."

"Number two apples shall be hand picked from the tree; shall not be smaller than two and one-quarter inches in diameter; the skin must not be broken or the apple bruised. This class must be faced and packed with as much care as number one fruit."

The different grades are variously designated, sometimes as fancy, choice, select, prime, XXX, XX, etc., but these designations have no official standing. There is so much variation in the practice of packing that none of these marks has any distinctive meaning.

In grading and packing apples a sorting table should be built somewhat in the form as shown in the illustration. It should be large enough to hold at least three barrels of apples spread out at one time. At one end there should be an opening or spout heavily



SORTING TABLE.

padded with gunny sacks. Through this opening apples may be guided and gently rolled into barrels. Some sorters prefer, however, to sort into baskets. The baskets are then emptied into barrels.

Considerable experience and natural good judgment are required to sort apples rapidly and accurately. The task is difficult and

highly important. The man assigned to it should be the best on the job.

In filling apple barrels, the work begins at what is really the top of the barrel. The head is put in and the barrel turned bottom side up on it. The first layer of fruit is put in by facing, stem downward, carefully on this inverted head. Good well-colored specimens are selected as facers, but they should not give a misleading idea of the general contents of the barrel. Usually a second row of facers is put in, stems down, in the same way. The remainder of the barrel is filled in with loose apples. These are thoroughly shaken down three or four times during the process of filling. Finally the barrel is sometimes finished by facing the last row in the bottom (that is on top as the barrel is filled). When the filling is complete the barrel should be somewhat more than full. The fruit should stand up two or three inches above the chimes. This amount will be taken up in pressing the head or the bottom in place. The bottom is pressed in with a screw or lever press, is nailed in place and the barrel is ready for the market.

APPLE BARRELS.

Customarily the package for selling apples is the barrel. There are various forms of barrels in use in this country, the two most common ones being the hundred quart barrel and the ninety-six quart barrel. The National Apple Shippers' Association have adopted the barrel having the following dimensions: stave $28\frac{1}{2}$ inches, head $17\frac{1}{4}$ inches, circumference in the middle 64 inches. This is the one hundred quart barrel. There seems to be a tendency at the present time to use more of the ninety-six quart barrels.

The barrel market, however, in the last few years has been a very difficult and unsatisfactory one. The prices have been abnormally high and promise to be higher than ever this season. It seems probable now that good barrels cannot be had anywhere for less than forty cents each. Under these circumstances many poor barrels are being used. Flour barrels are frequently employed and are in great demand. Such barrels should always be very carefully cleaned out before being used. Clean, fresh, unused barrels are always better. When handling large crops of apples it is doubtless the best practice to buy staves, hoops and heads in quantities, knocked down, and have the barrels made up on the farm by a cooper. At the present prices of barrel stock no great saving can be made in this way, but fresh, clean barrels are secured.

APPLE BOXES.

The high prices of apple barrels, taken in connection with the changing conditions of our markets, have led to the extended use of boxes. We have experimented to a considerable extent in the Department of Horticulture at the Massachusetts Agricultural College in the use of boxes for apples. While we are not ready to say that boxes are better than barrels, in general, we have found their use very satisfactory. Boxes should be used however only for strictly first-class fruit, and more especially for the early and soft-fleshed varieties. There is probably less margin of profit in handling standard winter fruit like Baldwin in the smaller package.

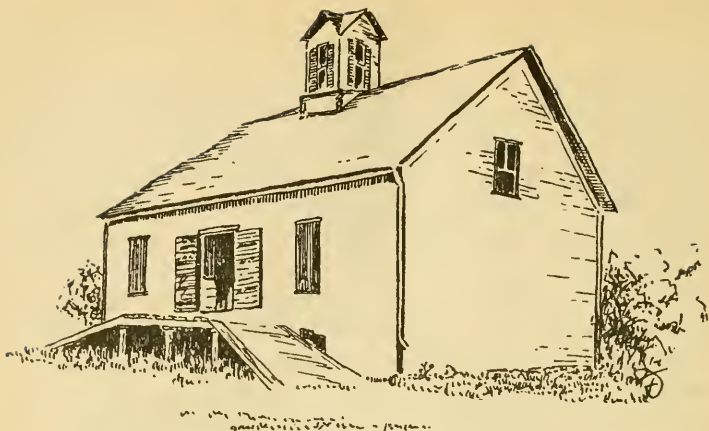
Many kinds of boxes have been used and recommended. The bushel box is probably the best under the present market conditions. These boxes are made up in a variety of styles. The one which seems to be the most attractive, and the one which we prefer, measures 10 x 11 x 20 inches inside. This gives a trifle over the standard bushel and weighs about fifty pounds filled. The ends are $\frac{7}{8}$ inch stuff and the top, bottom and sides are $\frac{1}{4}$ inch stuff. These cost about \$15 a hundred.

In shipping fancy apples in boxes, we have found it desirable to wrap the fruit in papers. Any clean, white paper will answer, but specially made tissue paper furnished by dealers for fruit wrapping is the most satisfactory. The papers are cut 10 x 10 inches square.

COLD STORAGE.

The cold storage business for apples has been rapidly developed in the last five years. It has also been greatly improved. The largest bulk of winter fruit now finds its way into the large city storage houses from which it is marketed as wanted. Many of these storage companies accept apples for storage direct from the growers. The prices charged for storage are from thirty to fifty cents a barrel for the season. This allows the fruit to be taken out at any time up to May 1.

The keeping of fruit in what is called common storage has been considerably diminished on account of the improved cold storage facilities. Quantities are still stored at home, however, in cellars or in houses constructed especially for the purpose. Such houses or fruit rooms are usually cooled in some way, usually by control of the ventilation. Well-built fruit houses of this type have proved very successful in the past. Their value is proportionally less, however, as the city cold storage becomes cheaper and more efficient.



A HOME APPLE STORAGE HOUSE HOLDING ABOUT 2,000 BARRELS.

METHODS OF SELLING.

There are many different ways of selling apples. Every man must judge from his own circumstances what method will be the most successful with him. This is a critical matter and failure is common here. Too many men seem to think that because someone else succeeds by certain methods of marketing, those methods are universally applicable. This part of the subject should receive very careful study from the man who has apples to sell. The principal methods of selling may be briefly summarized as follows:—

(1) *Retailing in the Home Market.*—Very often apples can be taken to the nearby village or city market in small lots and sold from the growers' wagons at fair or even fancy prices. The growers who are running vegetable or milk wagons commonly find this method the best one. In all cases where it can be adopted it is to be recommended. The fruit is promptly sold and the money is in hand. There is no trouble with transportation companies, commission men or other agents; and very often there is no expense for packages. Naturally this method is the best suited to the disposal of a miscellaneous collection of summer and fall apples rather than of the sale of a large block of Baldwins or some other winter variety.

(2) *On Trees.*—It has been customary for some years in western States for the growers to sell the crop on the trees. This practice has rapidly gained ground in Massachusetts. The buyer comes to the orchard and either pays a lump sum for the entire crop, or else pays a stipulated price per barrel. In the latter case the price is, say, \$1.50 for the best grade and \$1 for the second grade,

the grading being done by the buyer. This method has considerable advantages for the men who are not in close touch with apple markets, or who are not experienced in grading and packing fruit. It relieves the grower immediately of the two great responsibilities — grading and selling.

(3) *On Commission.* — One of the best recognized methods of selling is that of shipping the fruit on commission. When the barrels or boxes are ready, they are put in the hands of commission men, usually in one of the large city markets. The commission man sells them for what he can get and returns the amount to the grower minus the commission and any charges for freight, cartage, storage, etc. There are many disadvantages to this system, and much fault has been found with it, but on the whole it is the best method for a large number of growers. If a reliable commission house is selected and if the shipper is careful and honest on his side of the transaction, good results may be expected. Most of the cursing against commission men comes from shippers who have tried to cheat them.

(4) *On Joint Account.* — This is a new method of selling and not often adopted. According to this method the grower turns over his fruit to the seller at picking time, receiving a stipulated amount in cash down.

This is considerably less than the value of the fruit, say \$1 a barrel. The fruit is then held by the seller and disposed of at his option. At the close of the season when the fruit is all sold, the shipper and seller have a final settlement. From the gross amounts of the sales there is deducted first the advance payment made to the shipper. Then the storage, freight and other charges are subtracted. The balance is finally divided equally between the apple grower and the apple seller. In every instance which has come to our notice, this method has worked very well.

THE CURRENT CROP.

It may be proper to remark that, though 1904 is scheduled as "the apple year" with us, the crop now promises to be moderate. The most reliable reports that we have seen say that it will be less than last year. This is rather a safe way of estimating, for the markets handled more apples from the crop of 1903 than ever before in the history of American apple growing. Prices offered by buyers this fall will probably be about the same as in the fall of 1903. Though growers cannot generally expect to get better prices than a year ago, they should not be frightened into selling for less merely because this is called "the apple year" in Massachusetts.

MASSACHUSETTS
CROP REPORT

FOR THE

MONTH OF SEPTEMBER, 1904.

POULTRY CULTURE.

*ISSUED MONTHLY, MAY TO OCTOBER, BY STATE BOARD OF
AGRICULTURE, STATE HOUSE, BOSTON, MASS.*

J. LEWIS ELLSWORTH, *Secretary.*

ENTERED JUNE 3, 1904, AT BOSTON, MASS., AS SECOND-CLASS
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CROP REPORT FOR THE MONTH OF SEPTEMBER, 1904.

OFFICE OF STATE BOARD OF AGRICULTURE,
BOSTON, MASS., Oct. 1, 1904.

Bulletin No. 5, Crop Report for the month of September, is presented herewith. The reader's attention is called to the article at the close of the bulletin on "Breeds for the Farm and Farmers as Poultry Breeders," by John H. Robinson, editor of "Farm-Poultry." This article is in a measure supplementary to Mr. Robinson's previous articles on poultry matters, published in the crop reports of former years, each of which dealt especially with some phase of the poultry business as it applied to farmers rather than to poultry fanciers, but is complete in itself.

PROGRESS OF THE SEASON.

The monthly report of the Chief of the Bureau of Statistics of the United States Department of Agriculture (Crop Reporter for September, 1904) shows the condition of corn on September 1 to have been 84.6, as compared with 87.3 a month earlier, 80.1 at the corresponding date in 1903, 84.3 in 1902, and a ten-year average of 79.6.

The average condition of spring wheat was 66.2, the only comparison possible, this being the first time spring wheat has been separately reported, being with the previous month, when the condition was 87.5. The condition in the five principal States was reported as follows: Minnesota, 69; North Dakota, 63; South Dakota, 56; Iowa, 66; and Washington, 80, a decline during the month of 23, 27, 29, 14 and 1 points, respectively. •

The average condition of the oat crop was 85.6, against 86.6 a month earlier, 75.7 on the corresponding date in 1903, 87.2 in 1902, and a ten-year September average of 80.6.

The average condition of barley was 87.4, against 88.1 a month earlier, 82.1 on Sept. 1, 1903, 89.7 at the corresponding date in 1902, and a ten-year average of 82.1.

The average condition of rye on September 1 was 86.9, against 84.1 at the corresponding date in 1903, 90.2 in 1902, and a ten-year average of 85.8.

The average condition of buckwheat was 91.5, against 92.8 a month earlier, 91 at the corresponding date in 1903, 86.4 in 1902, and a ten-year average of 85.8.

The average condition of flax was 85.8, as compared with 78.9 a month earlier, and 80.5 on Sept. 1, 1903.

The average condition of tobacco was 83.7, against 83.9 a month earlier, 83.4 on Sept. 1, 1903, and a five-year average of 79.5.

The average condition of potatoes was 91.6, against 94.1 a month earlier, 84.3 in 1903, 89.1 at the corresponding date in 1902, and a ten-year average of 77.3.

The average condition of rice was 89.7, against 90.2 a month earlier, and 93.6 at the corresponding date in 1903.

Of the thirteen principal clover seed-producing States, four, namely, Wisconsin, Colorado, Utah and California, report increased acreages, while all the other principal States report decreases. In Indiana, Iowa and Colorado conditions are below their ten-year averages, while all other principal States report conditions above such averages.

The number of stock hogs being fattened was reported to be 2.4 per cent less than the number a year ago. Report as to size and weight indicated a condition of 94.2, as compared with 95.1 a year ago and a seven-year average of 94.3.

In Massachusetts the average condition of corn September 1, was given as 95; the average condition of oats as 99; the average condition of rye when harvested was 90; the average condition of buckwheat September 1 was 97; the average condition of tobacco 107; the average condition of potatoes 100; the average condition of apples 79; the product of peaches compared with a full crop 41; the average condition of grapes 89; the acreage of clover seed as compared with last year 94 and the average condition 105; the number of stock hogs for fattening compared with last year 99 and the average condition as to size and weight 98.

TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM UNITED STATES CLIMATE AND CROP BULLETINS.]

Week ending September 5. — The week averaged warmer than usual in the Middle Atlantic States, Ohio valley, throughout the southern States, over the western portions of the Plateau region and in the Pacific coast States, except along the immediate coast of Washington, where the temperature was slightly below normal. In the immediate south Atlantic and Gulf coast districts and in southern New England the temperature, though generally in excess, differed but slightly from the normal. In the central Rocky Mountain region and from the Missouri valley eastward to the northern New England coast the week was cooler than usual, being decidedly cool over the western portion of the upper Lake region, where the deficiency ranged from 6° to 8° a day. Heavy rains occurred over a considerable part of the central and west Gulf States, in portions of the Carolinas, and over much of the Lake region, upper Mississippi, upper Missouri and Red River of the North valleys, and there was considerably more than the average throughout the eastern Rocky Mountain slope and the southern Plateau region. In New England and the Middle Atlantic States and over most of the Ohio valley and east Gulf States the week was drier than usual, no appreciable rainfall occurring along the southern New England coast and over a considerable part of the Middle Atlantic States.

Week ending September 12. — The week averaged cooler than usual over the northern portions of the Lake region and in the Atlantic coast districts, Oklahoma, Texas and the southern portions of New Mexico and Arizona. Throughout the middle Gulf districts and central valleys and over the southern portions of the Lake region the temperature averaged nearly normal, although generally slightly above. In the middle and northern Rocky Mountain districts and in the Pacific coast States, except along the immediate north Pacific coast, the week was warmer than usual. The week as a whole was much drier than usual, large areas in the central valleys and Middle Atlantic States receiving no

appreciable amount of rain, while only light showers occurred over much of the Lake region and New England. Heavy rains fell, however, over a considerable part of the south Atlantic States and in the northern portion of the upper Mississippi valley. Rains continued over a large part of the southern Plateau region, but there was no appreciable rainfall in the middle and northern Plateau districts, or in the Pacific coast States.

Week ending September 19. — The week averaged cooler than usual over the Missouri, Red River of the North, Ohio and upper Mississippi valleys, throughout the entire Lake region, excepting portions of western New York, in north-western New England, over much of Virginia and the Carolinas, from Kansas southward to the Rio Grande, and generally along the immediate north and middle Pacific coasts. The temperatures were normal or slightly above throughout the Gulf States, except in parts of Texas, and generally throughout the eastern slope and the Plateau regions. The week was also slightly warmer than usual over most of New England and the Middle Atlantic States. Heavy rains occurred in portions of eastern Texas and in the lower Missouri and central Mississippi valleys, and were general throughout a narrow belt extending from North Carolina north-eastward to include parts of New England. Amounts in these districts ranged from two to six inches. The week was very dry over most of the central and eastern portions of the cotton districts, many places reporting no rain and others only light, inappreciable amounts, and, except in limited portions of Utah and Arizona, there was no appreciable rainfall from the eastern slope westward to the Pacific coast.

Week ending September 26. — The week averaged cooler than usual over New England, the Middle Atlantic States, the Lake region, the Red River of the North and upper Missouri valleys, and the greater part of the Pacific coast region. Over northern New England the deficiencies ranged from 6° to 10° a day. Throughout the remaining portions of the country the week was generally warmer than usual, the temperature average normal or slightly above over the Florida peninsula, the lower Ohio valley and most of the

Mississippi valley, and from 3° to 6° above throughout the greater part of Gulf districts, the eastern slope and Plateau regions. Unusually heavy rainfall for the time of year occurred during the week in western California. In the eastern districts from 1 to over 2 inches fell over much of Michigan, upper New England, the lower Lake region, Indiana and Illinois. Equally heavy falls occurred in southern Louisiana, interior Mississippi and southern Arkansas, and in limited portions of northern Texas and eastern Oklahoma. Over the remainder of the country the rainfall was generally less than normal, the week being very dry in the eastern cotton belt.

SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

Week ending September 5. — New England. Boston: Weather generally good for harvesting and maturing crops; light frost in north portion on 31st, little damage; rainfall light, unevenly distributed, rain needed; apples promise large crop of excellent quality; potatoes fair, but rotting badly in Connecticut and Rhode Island; corn promises large crop if weather continues favorable for two weeks; tobacco nearly all cut, large crop of excellent quality.

Week ending September 12. — New England. Boston: Light frosts in north on 7th, little damage; warmer weather and rain needed: corn being cut, good crop in south, backward in north, needing several weeks warm weather; sweet corn canning begun; potatoes being dug, fair crop indicated, except in Connecticut and Rhode Island, where extensively injured by rot; large crop of apples, exceptionally fine quality and color, except in Rhode Island and Connecticut; tobacco cut, excellent condition, early nearly cured, stripping early will begin next week.

Week ending September 19. — New England. Boston: Weather favorable; heavy rain on 15th of much benefit; potato digging general, much rot, only fair crop indicated; apples much damaged by wind of 15th in south portion, elsewhere coloring well and large crop of fine quality indicated; large crop of corn, field and sweet, of good quality

being cut, except in Maine; tobacco curing finely; ground in good condition for ploughing and seeding.

Week ending September 26. — New England. Boston: Weather generally fair; freeze on 22d, coldest ever known at this season, in places temperature below 20°; all corn, vegetables and cranberries not harvested killed, much loss in these crops; apples little injured, picking will soon begin; potatoes being dug, little rot in Maine and New Hampshire, continue rotting elsewhere; fall pasturage good; much ploughing being done.

WEATHER OF SEPTEMBER, 1904.

The weather of the month was marked by conditions that approached the extremes in several of the elements. During the first decade there was very little rain, the combined amount of the several showers being only sufficient to moisten the surface of the ground. On the 14th and 15th there was a downpour that has been but seldom equalled, and probably not exceeded in many years. From the 16th to the 24th inclusive there was almost an entire absence of rain throughout the State, and the fall during the remainder of the month was light and scattered. The month will go on record as one of unusually few rainy days, with abundant sunshine, but with a heavy total rainfall. The large precipitation of the month was, of course, the result of a single heavy storm, the 14th and 15th, which was the chief meteorological feature during the period. During this storm the winds along the coast reached hurricane force and shipping suffered great loss, as did also numerous other interests. While the temperature records of September do not present abnormalities so marked as those of precipitation, they show pronounced extremes. The maxima ranged in the 80s on a number of days, with muggy, oppressive atmosphere, and on the 22d and 23d it dropped suddenly to points ranging slightly above freezing in some sections to several degrees below in others. In some of the lowlands, with other conditions favorable, reliable reports placed the mercury as low as 20° above zero. At Boston, according to the official observations the minimum temperature, 35°, on the two

mornings mentioned above was the lowest for September in thirty-three years, with the single exception of 34° on the 26th of the month in 1879. The record was just equalled with 35° on the 23d of September, 1875. Viewing the temperature of the month from the monthly mean it did not depart greatly from the normal for September. Notwithstanding the unusual conditions of temperature and precipitation and the severe storm, September, considered as a whole, was a pleasant month.

In the circular to correspondents returnable to us September 26 the following questions were asked : —

1. How does the crop of Indian corn compare with a normal crop?
2. Are rowen and fall feed up to the usual average?
3. Has the usual amount of fall seeding been done, and what is its present condition?
4. How does the onion crop compare with a normal crop?
5. How do potatoes compare with the normal in yield and quality?
6. What is the prospect for root crops, celery and other late market-garden crops?
7. How have apples, pears, peaches, grapes and cranberries turned out?

Returns were received from 148 correspondents, from which the following summary has been made : —

INDIAN CORN.

Indian corn, though late, promised before the frosts of the mornings of the 22d and 23d to give a full normal crop of grain, and perhaps something more than the normal in the way of stover, but uncut corn was severely damaged, if not entirely ruined, on those dates, and much of that cut on the 21st in anticipation of the frost was not fully ripened and will contain many soft ears. Ensilage corn was mostly in the silo at that time, but enough remained in the field to seriously diminish the value of the crop. Where corn was well matured and cut in advance of the frost it is generally well eared and of excellent quality, both for grain and stover.

ROWEN AND FALL FEED.

For the State as a whole more than an average crop of rowen was secured, but there are some complaints from southeastern sections of a light crop, owing to prolonged drought during the season of growth. That rowen which was cut early was secured in good condition, but there is considerable complaint of damage to that later cut by reason of rains at time of making. Fall feed is in excellent condition in most sections, though where rowen suffered from drought fall feed is also short. The ground was well filled with water at time of making returns, and with seasonable rains during October pastures and mowings should go into the winter in good condition.

FALL SEEDING.

Less than the usual amount of fall seeding had been done at time of making returns, and much of that put in had not germinated, owing to dry weather at the time usually devoted to this work. Where the work had been done a good catch was generally reported and good growth so far as it had advanced. The heavy rains of the third week of the month must result in good germination of that previously sown, and have put the soil in excellent condition for such seeding as remains to be done.

ONIONS.

Onions are considerably under a normal crop for the State as a whole, though perhaps better than was anticipated earlier in the season. Maggot work and blight have been contributing causes to the shortage of the crop. The crop is drying down well and harvesting was well under way in the regions of commercial production at the time of making returns, some growers having marketed their entire crop. Prices received ranged from 50 to 65 cents, with perhaps an upward tendency.

POTATOES.

Potatoes would have been an unusually heavy crop but for rot, which will operate, however, to reduce the total

number of bushels secured to something below the normal. Size and quality are generally reported to be good, and where growers have escaped rot the crop leaves nothing to complain of. Prices, so far as reported, are not high, 50 cents per bushel being the price generally secured.

ROOT CROPS, CELERY, ETC.

Root crops generally promised well at time of making returns, though there were some reports of injury from frost. Celery is also a good crop, though somewhat late and small in some sections. Other late market-garden crops promise well and should give good yields. Squashes, cucumbers, tomatoes, sweet corn and beans, where not secured before the frosts, were generally ruined, but the actual money loss will be small, most of these crops raised for market being reported as gathered. Inconvenience will result, nevertheless, from the loss of these vegetables where grown for family use.

FRUITS.

There were some reports of apples being frozen on the trees on the mornings of the 22d and 23d, but these were not numerous enough to materially affect the yield. In western counties an extraordinarily heavy crop is generally reported, but in central and eastern sections the crop will be somewhat light as a rule. For the State as a whole the yield should be about normal, the number of trees being proportionately greater in the regions reporting a heavy yield. Pears are not more than a fair crop, taken as a whole. Peaches yielded well in some sections, but not at all or very lightly in most, the total result being a light crop even for Massachusetts. Grapes generally yielded well, but a large proportion of the later varieties was destroyed by frost, and there were also some complaints of rot. Cranberries were but a light crop when harvesting began, and in many sections a considerable proportion of the crop matured was destroyed by frost, with the total result of one of the lightest crops of recent years.

NOTES OF CORRESPONDENTS.

(Returned to us September 26.)

BERKSHIRE COUNTY.

Monterey (WM. S. BIDWELL). — Indian corn is an average crop. Rowen and fall feed are up to the usual average. About the average amount of fall seeding has been done and is in good condition. Potatoes are above the average in both yield and quality, but are rotting badly. The prospect is good for root crops, celery and other late market-garden crops. We have an extraordinarily heavy crop of apples.

Tyringham (E. H. SLATER). — The corn crop compares favorably with the normal. The rowen crop and fall feed are up to the usual average. The usual amount of fall seeding has been done and is in good condition. There is a large crop of potatoes of good quality. Root crops promise well. Apples are an abundant crop in this vicinity.

Lee (A. BRADLEY). — Indian corn is 95 per cent of a full crop. Rowen and fall feed are up to the usual average. One-third of the potato crop rotted, but that leaves a yield in excess of the usual and they are of excellent quality. Apples are a large crop of extra quality; pears and grapes half crops.

West Stockbridge (J. S. MOORE). — Indian corn is much better than last year. Rowen and fall feed are up to the usual average. About the usual amount of fall seeding has been done and it is looking well. Potatoes are a good crop, but there is some complaint of rot. Root crops and late market-garden crops are all good; celery much better than usual. There is an unusually heavy crop of apples but little other fruit. The heavy frosts of the 22d and 23d cut off all crops not matured, and those fields of corn that had to be replanted in the spring because of poor germination of seed suffered severely.

Richmond (TIMOTHY B. SALMON). — Indian corn is an average crop. The rowen crop and fall feed are up to the usual average. The usual amount of fall seeding has been done and is in good condition. Very few onions are raised here. The prospect is good for root crops, celery and other late market-garden crops. Potatoes are above a normal yield and of good quality. We have one

of the largest crops of apples and pears ever raised ; peaches little grown ; grapes were a good yield, but were badly injured by the recent frosts.

Hinsdale (THOS. F. BARKER). — Corn is less than an average crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and is looking well. Potatoes made a good yield, but rotted badly on rich land. Root crops, celery and other late market-garden crops have made a great growth and look finely. There is a fair crop of all kinds of fruit except peaches and grapes.

Peru (F. G. CREAMER). — Indian corn is about an average crop. Rowen and fall feed are in good average condition. Very little fall seeding is ever done in this locality. There is a large yield of potatoes but many complaints of rot, on some fields as high as fifty per cent of the crop being lost in this way. The prospect is very good for root crops and celery. There is a large crop of apples.

Cheshire (L. J. NORTHUP). — Corn will be about three-fourths of a normal crop. The rowen crop and fall feed are more than average. The usual amount of fall seeding seems to have been put in but is not far enough advanced to report on. Onions are a normal crop though little raised. Potatoes are a normal crop in yield and quality. The prospect for root crops is very encouraging notwithstanding the severe frosts. Apples, pears and other fruits are a fine crop ; apples were blown off some few days since but a good crop remains.

New Ashford (ELIHU INGRAHAM). — Indian corn is the best crop in ten years. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and is in good condition. Onions are a good normal crop. Potatoes are the best crop in ten years as regards yield and of good quality. Apples are a large crop and pears a fair one.

FRANKLIN COUNTY.

Rowe (F. W. WOFFENDEN). — Corn is below an average crop and many fields were injured by frosts. Rowen and fall feed are about average crops. Rather more fall seeding than usual has been done and is in good condition. Onions are little raised, but what few are grown are of poor quality. Potatoes are more than an average crop of fine quality. Root crops, celery and other late market-garden crops are looking well and promise full yields. Apples are a full crop in this section, though injured by the freeze

to some extent, and other fruits are above the average. Potatoes are rotting in some cases.

Colrain (A. A. SMITH). — Indian corn is fully up to a normal crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and has resulted in a good catch. Onions are better than a normal crop. Potatoes are a No. 1 crop in both yield and quality. Root crops, celery and other late market-garden crops promise finely. All kinds of fruit have turned out well. No frost until the 21st, but a severe one on that date.

Bernardston (R. H. CUSHMAN). — The corn crop is a good one, but the freeze damaged some fields. A large crop of rowen has been harvested. Early fall seeded land is looking well, with about the usual acreage put in. Potatoes show a large crop of fine quality, but with much rot in some fields. Root crops have made large growth and cabbages are a fine crop. Apples and pears are very large crops of good quality, but bring very low prices.

Gill (F. F. STOUGHTON). — Corn is a better crop than usual, but is late and does not ripen very rapidly. Rowen and fall feed are up to the usual average. Onions are little raised. Potatoes are better than an average crop. Root crops, celery and other late market-garden crops are not much raised. Apples and grapes are an extra yield. Tomatoes are a good crop.

Shelburne (GEO. E. TAYLOR). — Indian corn is more than a normal crop. Rowen is more than an average crop and fall feed is good. About the usual amount of fall seeding has been done, a good catch has been secured and it is looking finely. Potatoes are above the average in yield and of fine quality. Root crops, celery and other late market-garden crops are not raised. Apples are less than an average crop and there are few pears and peaches. A very severe frost visited us the 22d and 23d, cutting corn fodder and tender vegetation. The damage to fodder is considerable, but the grain is beyond injury.

Deerfield (H. A. WELLS). — Indian corn is a normal crop. The rowen crop and fall feed are up to the usual average. There has been about the usual amount of fall seeding done; it is practically all sown in corn and looks well. Onions are about an average crop. Potatoes made a big yield, but there are many complaints of rot. Root crops, celery and other late market-garden crops are not grown. Apples are a big crop; pears plenty; no peaches; late grapes injured by frost. The tobacco crop is curing down, a thin, light leaf, no pole sweat and a few crops sold on poles. There is very little damage to field corn except to the fodder.

Sunderland (J. M. J. LEGATE). — Indian corn is late and was badly damaged by frost the mornings of the 22d and 23d. There is a very heavy crop of rowen and fall feed to match. About the usual amount of fall seeding has been done and it is looking finely. Onions are about an average crop; some very fine fields, but they are the exception and not the rule; acreage larger than usual. Potatoes are rotting badly as a rule and therefore the crop is below the average. Root crops, celery and late market-garden crops are little raised. There is a very heavy crop of apples but few pears and peaches.

Leverett (W. L. BOUTWELL). — Corn is not over a three-fourths crop as it was late and suffered severely from frost. Rowen and fall feed are up to the usual average. About the usual amount of fall seeding has been done and is in fine condition; mostly seeded in corn. Onions are about an average crop. Potatoes are much above the average in yield, but are rotting somewhat. The prospect is good for root crops, celery and other late market-garden crops. Apples and pears are average crops and cranberries much above the normal in yield.

Montague (C. S. RAYMOND). — Indian corn is about an average crop. Rowen and fall feed are the best for a number of years. About the usual amount of fall seeding has been done and it is looking well. Onions are fully up to the normal in yield. Potatoes have yielded well and are of good quality. Root crops promise average yields; celery not much grown. Apples are abundant, but other fruits are poor crops.

HAMPSHIRE COUNTY.

Belchertown (H. C. WEST). — Indian corn is hardly up to the normal, as the freeze came ten days too early. Rowen is a fair crop where the first crop was taken off early and fall feed is good. Fall seeding is now being done and seems to be doing well. A good crop of potatoes, both in quantity and quality, is being harvested. Turnips, celery, beets, cabbages, etc., promise about average crops. Apples good; pears fair; peaches few. Crops as a whole are nearly or quite up to the average and prices as well.

Pelham (JOHN L. BREWER). — Corn is quite a good crop, though some of the stover was hurt by frost. There is a good crop of rowen, but fall seed has suffered from drought. Less than the usual amount of fall seeding has been done and that put in is not yet up. Onions are not much raised, but a few good pieces are noticed. Potatoes are a fine crop in quality and yield, but many

pieces have rotted badly. Root crops, celery and other late market-garden crops generally promise well. Apples and pears are quite good crops.

Amherst (WM. P. BROOKS). — Corn made an excellent growth, but much of the crop is immature and a considerable proportion of both ensilage and field corn was injured by the frosts of the 21st and 22d. Rowen was a full average crop on early cut mowings, light on late cut; fall feed average. An average amount of fall seeding has been done and is in good condition. Onions are probably slightly below an average crop, but on the whole pretty good. Potatoes are an average crop of good quality, but rot is serious in some places. Root crops excellent; celery healthy but a little backward. Apples are a large yield of good quality; pears a fair yield; no peaches; grapes a good crop; plums yielded heavily. Tobacco is reported to be curing well. Many silos yet to be filled and corn badly frozen.

Hadley (L. W. WEST). — Indian corn would have been above the average, but late fields were injured by frost on the 21st and 22d, so that there will be more soft corn than usual. Rowen is above the average. The usual amount of fall seeding has been done and it is in good condition. The onion crop is about an average one and is selling at from 50 to 65 cents per bushel. Potatoes are less than an average crop and there is rot in some fields. Root crops not injured by frost are looking well. The severe winter killed peaches, and the early frosts have damaged grapes that were unpicked. There were fewer pears than usual and apples are an average crop. Tobacco is bringing good prices.

Granby (GEO. A. BLISH). — Indian corn is about a three-fourths crop. As a rule rowen is light, though some report a full crop. About the usual amount of fall seeding has been done and where it was put in early is looking well. Potatoes are a good yield, but are rotting badly. Turnips are looking well; other root crops, as well as celery and late market-garden crops, are little raised. There is a good crop of apples and pears; no peaches and only a few grapes and cranberries.

Easthampton (WM. E. CLAPP). — Corn is not up to an average crop. Rowen and fall feed are up to the usual average. About the usual amount of fall seeding has been done and it is looking well. Onions are not a normal crop in yield. Potatoes yield well and are of fine quality, but there is some rot. Beets are a fine crop; other root crops not much grown. Apples are abundant; pears, peaches and grapes not up to the average yield.

Williamsburg (F. C. RICHARDS). — Indian corn was a full aver-

age crop, but was badly damaged by frost the 22d and 23d. Rowen and fall feed are up to the usual average. The yield of potatoes was heavy, but they are rotting badly. The prospect is good for root crops, celery and other late market-garden crops. Apples are a fair crop, but not a full even-year average on Baldwins; Greenings a full crop; pears light; peaches a full crop, but suffered severely from freezing; grapes good.

Cummington (S. W. CLARK). — Corn has made a very good growth, but is not well ripened. Rowen and fall feed are a little above the usual average. The usual amount of fall seeding has been done and it is in good condition. The yield of potatoes was very good, but from 25 to 50 per cent were lost from rot. The prospect is very good for root crops, celery and other late market-garden crops. Apples, pears and cranberries very good; grapes spoiled by frost on night of the 22d; peaches not much grown.

Worthington (C. K. BREWSTER). — Indian corn is about a normal crop. Rowen and fall feed are rather better than usual. About the usual amount of fall seeding has been done. No onions raised here. Potatoes are a good yield, but are rotting badly. Root crops, celery and other late market-garden crops are about average in condition and promise. There is an abundant crop of apples and pears, but few peaches, grapes or cranberries. Frosts on the 22d and 23d did some damage.

HAMPDEN COUNTY.

Tolland (E. M. MOORE). — Indian corn though a little late is about an average crop. Rowen and fall feed are above the usual average. About the usual amount of fall seeding has been done and is in good condition. There was a big crop of potatoes, of good quality, but a large percentage of the crop rotted in the ground. Root crops promise about average yields. Apples are more than an average crop and wild cranberries are plenty.

Blandford (ENOS W. BOISE). — Some fields of Indian corn are extra good, but generally the crop is about 80 per cent of the normal. Rowen and fall feed are extra good. Few onions are raised here and those raised were injured by the onion maggot. Potatoes were a very heavy crop where there was no rot, but most fields showed rot, even those sprayed; many leaving potatoes in the ground as yet. Late garden crops promised well, but the recent frosts cut them nearly all off so that they are a failure. Pears are a good crop; apples a heavy crop and very fair, but perhaps not up to the normal in size on account of the large amount on the trees.

Russell (E. D. PARKS). — Corn is about an average crop, better than last year. Rowen and fall feed are rather above the usual average. Less than the usual amount of fall seeding has been done in our section. Onions are a fairly good crop but are little raised. Potatoes are up to the normal in yield, but a good many fields are rotting. The prospect is very good for root crops, celery and other late market-garden crops. There is a good crop of all kinds of fruit.

Agawam (J. G. BURT). — Corn is a good crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and looks well. Onions are better than a normal crop. Potatoes are about a normal crop in yield and quality, but are rotting badly. The prospect is good for root crops, celery and other late market-garden crops. All kinds of fruit have turned out well.

West Springfield (T. A. ROGERS). — Indian corn made a full growth, but is not all fully ripened. Rowen and fall feed are well up to the usual average. The usual amount of fall seeding has been done and is looking finely. Onions are perhaps three-fourths of a normal crop. Potatoes made a good yield and are of fine quality. Root crops and celery are looking well; also nearly all market-garden crops. Apples are a drug on the market; no peaches; pears and grapes good; no cranberries to speak of.

Chicopee (R. W. BEMIS). — I should say that the corn crop was fully up to the normal. Rowen and fall feed are above the usual average. Potatoes are a good crop in this vicinity. Root crops, celery and other late market-garden crops will give good yields if they were not damaged by the frost on the evening of the 22d. Apples, pears, peaches and grapes are all good crops.

East Longmeadow (JOHN L. DAVIS). — Indian corn is above an average crop. Rowen and fall feed are not up to the usual average. Fall seeding is in poor condition, owing to drought, but should come along well now. The yield of potatoes was uneven, but the quality fine, with some rot. The dry weather made root crops slow in starting. Apples and grapes plenty; pears and peaches scarce.

Monson (F. D. ROGERS). — Corn shows a full growth of stover, but many fields have not eared out as fully as usual. Rowen and fall feed are up to the usual average. Not as much fall seeding as usual has been done, but it is looking well. Potatoes are not all harvested as yet, but seem to be a good crop in both yield and quality. The prospect for root crops, celery and other late market-

garden crops is very good. Apples and pears are of better quality than usual; peaches a light crop; grapes rotted badly.

Palmer (O. P. ALLEN). — Indian corn is not quite up to the average. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and it is in good condition. Onions are not much raised. Potatoes have yielded well and are of fine quality. Root crops, celery and other late market-garden crops promise well. Fruit of all kinds has turned out well, with the exception of peaches, of which there were but few.

WORCESTER COUNTY.

Dudley (J. J. GILLES). — Indian corn is a normal crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and is in good condition. The yield of potatoes was plentiful, but half the crop has rotted. The prospect is good for root crops, celery and other late market-garden crops. There is a full crop of all kinds of fruit.

Warren (W. E. PATRICK). — Corn is about two-thirds of a normal crop. The rowen crop is fully up to the average and fall feed is good. Not as much fall seeding as usual has been done. There is a normal yield of potatoes of good quality, where not rotting, but on many fields fully one-half have rotted. Apples are a large crop; pears good; peaches scarce; large crop of grapes and cranberries a very fine crop.

North Brookfield (JOHN H. LANE). — The growth of corn fodder was immense, but the frost of the 21st injured it severely as it is two weeks late. The rowen crop was away above the average, but much of it was spoiled in harvesting. We seed but little in the fall. Potatoes are a good average, with rot in some instances. The prospect is good for root crops, celery and other late market-garden crops. Apples are 40 per cent of a full crop; pears half a crop; grapes and cranberries full crops.

Oakham (JESSE ALLEN). — Indian corn is a full average crop. Rowen was up to the usual average; fall feed injured by frost September 22d. The usual amount of fall seeding has been done and looks well. Very few onions are raised. Potatoes are a full average yield, but show some rot. The prospect is good for root crops, celery and other late market-garden crops. The fruit crop is abundant and of excellent quality.

Dana (LYMAN RANDALL). — Indian corn will be fully an average crop. The rowen crop is good and fall feed in average

condition. There has not been as much fall seeding done as usual, but what has been put in looks well. Potatoes are rotting somewhat, but will be an average crop of fine quality. Root crops are good, but late cabbages are not heading well. All fruits have turned out well except peaches and Baldwin apples. Cows have fallen off in quantity and quality of milk during the last two months, with no apparent reason, as they are in good condition and have had plenty of feed.

Phillipston (A. D. CLIFFORD). — The crop of Indian corn is up to the average. Rowen is a fair average crop, but not up to last year. Not much fall seeding is done in this section. Potatoes are above the average in size, yield and quality, but show some rot. Most late market-garden crops give good promise, though the heavy frosts stopped the growth of late beets somewhat. Apples, pears and grapes are good crops; not many peaches and cranberries in this section, and those not harvested damaged by the freeze of last week.

Templeton (LUCIEN GOVE). — Corn is a good average crop, but being rather late there is considerable soft corn. The drought of the latter part of August and the first of September reduced the rowen crop somewhat, but it is well up to the average, as is also fall feed. Less than the usual amount of fall seeding has been done, owing to drought, but what has been put in looks well. Potatoes are rather above the average in yield and of fine quality, but are rotting somewhat. The prospect for root crops, celery and other late market-garden crops is quite good. Apples and pears good; no peaches; grapes light. The freeze of the 22d and 23d killed all vines and spoiled all unsecured squashes, pumpkins, cucumbers, tomatoes, beans and unripe corn. Apples are not excessive in quantity for the bearing year; quality of winter apples quite good.

Ashburnham (E. D. GIBSON). — There is some good ensilage corn, but corn for grain is light and all immature with few exceptions. Rowen is on the whole less than an average crop. Not as much seeding as usual has been done, but what is in is in good condition. Potatoes are fully an average crop of good quality, but with some rot. Carrots, turnips and beets are fine crops. Apples and pears are good crops; peaches and grapes late and damaged by frost.

Fitchburg (JABEZ FISHER). — Rowen and fall feed are very nearly up to the usual average. There is a full average yield of potatoes of good quality, but some rot and blight. Apples 90 per

cent of a full crop; pears 80 per cent; peaches 50 per cent; grapes 30 per cent. The freeze of September 22d and 23d destroyed all the grapes. In the last forty-eight years there has not been a killing frost in September until this year. Tree fruits have been unusually free from worms and blemishes.

Hubbardston (CHAS. C. COLBY). — The corn crop is the best for years, both for fodder and grain. Rowen is above the average and fall feed is very good. What seeding has been done is looking excellently. There is a large yield of potatoes, but a good deal of complaint of rot. Apples and pears are plenty; grapes only an average crop.

Bolton (H. F. HAYNES). — Indian corn is a good crop, but very little grown, as it did not come up in the spring. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and is looking well. Maggots have worked onions badly, but there may be three-fourths of a normal crop. Potatoes are about a normal crop in yield and quality. The prospect is good for root crops, celery and other late market-garden crops. There is a three-fourths crop of apples; a good crop of peaches on a few orchards on high ground; pears and grapes few; cranberries poor.

Holden (G. S. GRAHAM). — Corn was very nearly an average crop. Rowen and fall feed are fully up to the average. About the usual amount of fall seeding has been done and with a good season it should do well. Potatoes made a good yield and are of good quality, but one-third of the crop has rotted. Root crops are fair, but below the average. Winter apples are not very abundant. Autumn fruit not worth picking; pears plenty and cheap; grapes late and frozen.

Worcester (H. R. KINNEY). — Indian corn was late and most of it was caught and more or less damaged by frost. Rowen and fall feed are up to the usual average. Onions are late and rather small and of poor quality. The yield of potatoes was good and the quality fair, but with considerable rot. Root crops look well; celery fair; cabbage and cauliflower doing well. Apples promise a good crop; pears, peaches and grapes light. The severe frosts of the 21st and 22d killed all tender vegetables and damaged celery and cauliflower to some extent.

Sutton (C. P. KING). — Indian corn is not as good as usual, being late and badly damaged by frost. Rowen light, but fall feed in good condition. Not much seeding has been done, but spring seeding is looking well. Quality of potatoes poor, yield

light and rotting badly. The prospect is good for root crops, celery and other late market-garden crops. Fruit of all kinds, with the exception of cranberries, is a light crop.

Hopedale (DELANO PATRICK). — Late planted corn is less than an average crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and though late in starting is now growing well. Potatoes are a good yield, but there is considerable rot on some fields. There is a light crop of apples and pears; grapes average.

MIDDLESEX COUNTY.

Sherborn (N. B. DOUGLAS). — Corn is above an average crop. Rowen and fall feed are fully up to the usual average. The usual amount of fall seeding has been done and looks fairly well. There is a good yield of potatoes but much rot. Root crops, celery and late market-garden crops are all looking well; squashes show a very heavy yield. Apples half a crop; pears 80 per cent; no peaches; grapes and cranberries average.

Hopkinton (W. V. THOMPSON). — Indian corn is more than an average crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and is in good condition. Potatoes are more than a normal yield and of extra quality. The prospect for root crops, celery and other late market-garden crops is good. Apples are rather a light crop; pears light; no peaches; grapes late; cranberries good.

Marlborough (E. D. HOWE). — Indian corn is 75 per cent of a normal crop. Rowen and fall feed are up to the usual average. About the usual amount of fall seeding has been done and it is still going on. Onions are a three-fourths crop. Late potatoes are not yet harvested. Apples a three-fourths crop; pears half a crop; peaches 10 per cent; grapes 100 per cent. The first frost of the season came September 21st and was a killer.

Sudbury (EDGAR W. GOODNOW). — The crop of Indian corn is above the average. Rowen and fall feed are above the average. The usual amount of fall seeding has been done and at present looks well. The onion crop is below the normal. The potato crop is above the normal in yield and quality. Roots of all kinds are looking well. Apples, pears, grapes and cranberries have turned out well.

Stow (GEO. W. BRADLEY). — Corn is about an average crop. Rowen and fall feed are up to the average and on early cut fields rowen is better than usual. Not as much fall seeding as usual has

been done, but what there is is looking well. Onions are not as good a crop as usual, owing to maggots and poor seed. Potatoes are yielding fairly well, but some rot is reported. Root crops are yielding well. Apples are turning out well; pears good; no peaches; a few grapes and cranberries. Squashes were raised quite extensively and most of them ripened before the frosts.

Groton (GEO. S. KNAPP). — Corn is a good crop, except that late planted fields are not fully ripe. Rowen and fall feed are up to the usual average. Hardly the average amount of fall seeding has been done and it is backward. Potatoes are a good crop in yield and quality. The prospect is good for root crops, celery and other late market-garden crops. Apples are plenty; pears fair; peaches a light crop. We had a heavy frost on the 23d.

Pepperell (FRANK W. AMES). — Indian corn is a better crop than for two years past. In this section rowen and fall feed have been better than usual. Not as much seeding has been done as usual, because of dry weather, but much will be done later. The yield and quality of potatoes are better than for some time. Cabbages and squashes are excellent and all root crops are fine. Apples are two-thirds of a good crop; pears fair; grapes and cranberries raised only for home use, and were injured by frost. Some potato rot is reported, but it has not proved as serious as was feared.

Dunstable (A. J. GILSON). — The crop of corn is about up to a normal crop. Rowen and fall feed are above the average. A good amount of fall seeding has been done and is in fine condition. The onion crop is somewhat lighter than usual. Potatoes are a good crop of good quality. The prospect for root crops is good; late market-garden crops raised only in a limited way. The apple crop is large; pears and peaches light; grapes and cranberries above the average.

Chelmsford (P. P. PERHAM). — Indian corn is more than an average crop. Fall feed is abundant and a large crop of rowen has been secured. The usual amount of fall seeding has been done, with a good catch. Very few onions are grown here, but what there are are a good crop. A large crop of potatoes of excellent quality has been secured. Root crops, celery and other late market-garden crops all promise well. There is a light crop of winter apples; very few peaches; grapes plenty; cranberries damaged by frost.

Billerica (GEO. P. GREENWOOD). — Rowen and fall feed are up to the usual average. Potatoes are below the normal in yield. The prospect is good for root crops, celery and other late market-

garden crops. Baldwin apples are not a full crop, but the quality is excellent. Frost has injured grapes and cranberries. There is some complaint that cattle are giving less milk than the abundance of feed should warrant.

Teuksbury (G. E. CROSBY). — Early planted corn is good but there is very little grown here. Rowen and fall feed are rather better crops than usual. Less than the usual amount of fall seeding has been done as yet, but what has been seeded is starting well. In fields free from maggots the onion crop is good. There is a fair yield of potatoes of good quality, except where troubled by rot. The prospect is about as usual for root crops, celery and other late market-garden crops. Apples and pears are abundant; peaches scarce; wild grapes plentiful.

Carlisle (F. J. CARR). — Indian corn is below an average crop. Rowen and fall feed are about the usual average. About the usual amount of fall seeding has been done and is looking well. Onions are little raised. Potatoes are about an average crop of good quality. Root crops, celery and other late market-garden crops are all looking well. Apples, pears and peaches are light crops; grapes and cranberries large crops.

Winchester (S. S. SYMMES). — Rowen and fall feed are not up to the usual average. Very little seeding has been done and the growth so far is slow. Onions are less than a normal crop. Potatoes are a much smaller crop than usual. Beets are a good crop; celery still very small. Apples and pears light crops; some peaches yielded well. Heavy frost ruined many tomatoes, peppers and corn.

Stoneham (J. E. WILEY). — There is but little Indian corn raised in town. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and it is in good condition. Potatoes are not up to the average in yield. The prospect is good for root crops, celery and other late market-garden crops. Apples good; pears fair; grapes and cranberries good. The brown-tail caterpillars have attacked many pear trees to such an extent that the pears have withered and dropped off.

ESSEX COUNTY.

Haverhill (EBEN WEBSTER). — Corn will be less than a normal crop, owing to cold weather. Rowen and fall feed are about as usual. Fall seeding is rather late, but much is now being done. Potatoes have yielded fairly, with some rot. The prospect is good for root crops, celery and other late market-garden crops. Apples

and pears plenty; peaches few; grapes fair; cranberries not much grown. Hard frosts on the 22d and 23d injured corn and destroyed beans, melons, tomatoes and other tender vegetables.

Newbury (GEO. W. ADAMS). — There is a fair average crop of Indian corn. Rowen is nearly an average crop, but is late on account of drought. Hardly the usual amount of fall seeding has been done as yet, the ground having been too dry to plough until recently. Potatoes are an excellent crop, perhaps 10 per cent above the average. Until the frosts of the 21st and 22d the promise was good for root crops, celery and other late market-garden crops, but these frosts did great damage. Apples are less than an average crop; pears fair; peaches fair to good; cranberries considerably above average.

North Andover (PETER HOLT). — Corn is a fair crop, but suffered some injury from the frost of the 22d. Rowen is light owing to dry weather and the late cutting of the first crop. Fall seeding has not come up as well as usual, owing to dry weather, but about the usual amount has been done. Onions are less than a normal crop, owing to failure of the seed to germinate well. Both early and late potatoes are good crops, with very little blight or rot. The prospect is good for all kinds of roots, especially turnips; cabbage and celery above the average. Apples are holding on the trees remarkably well; a full crop of cranberries has been harvested; pears, peaches and grapes are also abundant.

Topsfield (B. P. PIKE). — Indian corn is not more than two-thirds of a normal crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and is in fair condition. There is a medium crop of onions. Potatoes are an average yield of good quality. Apples a good crop; other fruits not of much account.

Wenham (N. P. PERKINS). — Not much corn is raised in this vicinity except sweet corn and corn for the silo. There is a fair crop of rowen, but not much fall feed. Our farmers have been rather backward about fall seeding and some still remains to be done; that which is up looks well. Potatoes as a rule are a small crop and not of extra quality, while some fields are almost destroyed by rot. Carrots and beets are fair crops. Apples are rather small and poor; not many pears; no peaches; but few grapes; some cranberries, but those picked early are badly frost-bitten.

Manchester (JOHN BAKER). — Indian corn is a good average crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and is in good con-

dition. Onions are not as good a crop as usual. Potatoes are less than a normal crop. The prospect is good for root crops, celery and other late market-garden crops. Apples and pears are fair crops; no peaches; few grapes; cranberries destroyed by the frost.

NORFOLK COUNTY.

Randolph (RUFUS A. THAYER). — Indian corn is a good average crop. Rowen and fall feed are up to the usual average. Not much fall seeding has been done as yet. Onions are about an average crop. Potatoes are a large crop of good quality, but with considerable rot. Apples half a crop; pears good; no peaches; grapes and cranberries badly damaged by the recent frosts. Celery, turnips and cabbages promise good crops.

Canton (E. V. KINSLEY). — Corn is a full average crop. Rowen started well, but dry weather cut it off, and three weeks of continuous dry weather have completely destroyed fall feed. Fall seeding is a little late, but conditions are now favorable. Onions are a fine crop and well ripened. Potatoes are a good crop of fine quality, but there is some complaint of rot. The prospect for root crops, celery and other late market-garden crops is good, except for those crops affected by frost. Apples in this section are a disappointment; pears and peaches a failure; grapes and cranberries good. Heavy frosts on the mornings of the 22d and 23d completely destroyed all growing corn, tomatoes, grapes and every other thing at all tender.

Westwood (HENRY E. WEATHERBEE). — Corn is late and will not be up to the average. Rowen and fall feed are not as heavy as usual. About the usual amount of fall seeding has been done, but it was late in starting, owing to dry weather. Potatoes are a light crop and rotting somewhat. Root crops will be up to the average. Apples will be small; pears and peaches a light crop; grapes and cranberries good.

Walpole (EDWARD L. SHEPARD). — Indian corn is 25 per cent below a normal yield. Rowen and fall feed are not up to the usual average. Less than the usual amount of fall seeding has been done and it is not in good condition, owing to dry weather. Onions are a good crop. Potatoes are about a two-thirds crop in yield, rather small and with some rot. Root crops are backward on account of dry weather. Pears and apples are half crops; no peaches; grapes and cranberries fair crops.

Franklin (C. M. ALLEN). — Corn shows a good crop of stover but a light yield of ears. Rowen and fall feed are above the usual average. The usual amount of fall seeding has been done and it

is looking well. Potatoes are a good yield, but show considerable rot. Apples are a good crop; pears light; peaches few; grapes light; cranberries half a crop.

Foxborough (E. A. MORSE). — Indian corn is above an average crop. Rowen and fall feed are the best for years. Not much fall seeding has been done as yet. Potatoes made a fine yield, but there is complaint of rot. Apples, pears and cranberries were small crops.

BRISTOL COUNTY.

Mansfield (WM. C. WINTER). — Corn was perhaps injured by frosts, but is otherwise above the normal; not much grown here. Rowen is above the average and fall feed well up to it. About the usual amount of fall seeding has been done and it is looking finely. Onions are little grown. Potatoes made a normal yield, but have rotted badly. Root crops, celery and other late market-garden crops look quite promising. Apples at one time looked fairly good, but the high winds have played havoc with them; pears a medium crop; peaches light; grapes medium; cranberries uncertain.

Attleborough (ISAAC ALGER). — Indian corn is a full average crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and is in good condition. Potatoes are a good crop of average quality. The prospect is good for root crops, celery and other late market-garden crops. Fruits of all kinds are small crops, with the exception of grapes.

Swansea (F. G. ARNOLD). — Indian corn is fully up to the average. Rowen is a very good crop and fall feed up to the average. About the usual amount of fall seeding has been done and is looking well. Onions are about an average crop. Potatoes rotted badly where they were not sprayed, but the quality is otherwise good. Plenty of rain has given all root crops a good growth. Apples, pears and peaches are very poor crops; grapes plenty; cranberries not grown.

Westport (ALBERT S. SHERMAN). — Indian corn is a very good crop, better than average. There is a good crop of rowen and fall feed is plenty. The usual amount of fall seeding has been done and it is looking finely. The onion crop is not large, the onion maggot having done much damage. Potatoes are of good quality, but the yield is not large as they have rotted badly. Turnips and cabbages promise well; very little celery raised. Apples plenty; pears scarce; peaches and grapes plenty.

Dartmouth (L. T. DAVIS). — The corn crop was badly dam-

aged by the heavy gale and rainstorm of last week and was further damaged on the nights of the 21st and 22d by heavy frosts. Rowen and fall feed are up to the usual average. Less than the usual amount of fall seeding has been done, but I think it is in very good condition. Onions are less than a normal crop. Potatoes have rotted too much for a full crop, but the quality is otherwise good. The prospect for root crops, celery and other late market-garden crops is very good. Apples are less than half a crop; pears two-thirds of a normal crop; no peaches; grapes 60 per cent of a full crop.

Acushnet (M. S. DOUGLAS). — Late planted corn suffered severely on the nights of the 21st and 22d from heavy frosts; early planted fields generally up to the average. Rowen and fall feed are more than average crops. Fall seeding is backward and is just beginning to make a showing. Onions are a good crop this year, more than average. Potatoes are about a two-thirds crop of good quality. Celery good; turnips and carrots looking finely; late cabbages not heading well. Few apples and pears; no peaches; grapes below average.

PLYMOUTH COUNTY.

Brockton (DAVIS COPELAND). — Corn is about 90 per cent of a full crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and is in good condition. Onions are about 80 per cent of a full crop. Potatoes are about a three-fourths crop in quantity and the quality is not of the best. Root crops, celery and other late market-garden crops were looking well, but the frosts of the last few days have checked and spoiled the growth. There is a slim crop of fruit.

Marshfield (JOHN H. BOURNE). — Indian corn is late, and frost came a little too early for best results, but on the whole it is up to the normal. Rowen is very nearly a normal crop, though the drought of last month cut it short a little. Less than the usual amount of fall seeding has been done; recent rains are helping it. Onions are little raised here now, where years ago thousands of bushels were grown. Potatoes are from 10 to 20 per cent more than a normal crop and of excellent quality. Not many market-garden crops are raised. Apples are a smaller crop than last year and pears the same; grapes and cranberries light crops.

Pembroke (NATHANIEL MORTON). — Indian corn is a fair crop. Rowen and fall feed are in excess of the usual average. Very little fall seeding has been done. Onions are only raised for table use and have yielded fairly well for that purpose. The yield of

potatoes is large, but the crop suffered from rot. The prospect for root crops, celery and other late market-garden crops is fair. Apple crop small and poor in quality; pears fair; no peaches; grapes medium; cranberries injured by frost.

Hanson (F. S. THOMAS, M. D.). — Indian corn is a good crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and is in good condition. No onions worth mentioning are raised. Potatoes are a good yield but are rotting badly. Fruit is not turning out very well. The "freeze" of the 22d and 23d finished gardens.

Kingston (GEORGE L. CHURCHILL). — Indian corn is an average crop. Rowen and fall feed are up to the usual average. Less than the usual amount of fall seeding has been done. Onions will give a very small crop. Potatoes are a very fair crop. The prospect is very fair for root crops, celery and other late market-garden crops. Apples are not plenty and cranberries only a fair crop.

Plympton (WINTHROP FILLEBROWN). — Where seed was good there has been an excellent crop of corn. Rowen is not up to the average as the first crop was cut late. Fall seeding is looking very well indeed and about the usual amount has been put in. Onions have proved a very successful crop this year. Potatoes have not yielded well and rot has been quite prevalent. Root crops and celery promise better than average yields. Apples are only a fair crop; peaches a failure; grapes a very good crop. There was a good showing of cranberries on bogs not injured by the hailstorm of the early summer, but the heavy frost injured a large amount of these.

Rochester (GEO. H. RANDALL). — Corn is about an average crop. Rowen and fall feed are rather better than average crops. Less than the usual amount of fall seeding has been done and it is in very good condition. Onions are about three-fourths of an average crop. Potatoes are a smaller crop than was expected and much rot and scab are reported. Early apples and Baldwins have yielded fairly well; pears and grapes average crops; peaches but few; cranberries generally better than expected, but some bogs badly damaged by frost. The prospect is very good for root crops, celery and other late market-garden crops.

BARNSTABLE COUNTY.

Bourne (DAVID D. NYE). — Indian corn compares favorably with a normal crop. Rowen and fall feed are fully up to the usual average. The usual amount of fall seeding has been done and it

is at present in good condition. Onions did not do well. Potatoes are a good crop in most places, but with some rot. The prospect is very good for root crops, celery and other late market-garden crops. Apples, pears, peaches and grapes are all small crops in this vicinity. Cranberries did finely, but the frost of the 22d destroyed several hundred barrels.

Mashpee (W. F. HAMMOND). — There will be about an average crop of Indian corn. Rowen and fall feed are above the usual average. The onion crop is below the average. Potatoes are above the average in quantity, but below in quality. Root crops are above the average. Apples and pears are not more than half crops; cranberries a three-fourths crop. The frost of the 22d and 23d destroyed about one-third of the cranberries then unpicked, also grapes, beans and late corn.

Dennis (JOSHUA CROWELL). — Corn is about a normal crop. Rowen and fall feed are above the usual average. There is but little fall seeding done here. The onion crop is much below the normal; not more than half a crop. There is an average yield of potatoes, but with more or less rot. The prospect for root crops, celery and other late market-garden crops is good. Heavy winds have shaken off nearly all winter apples. Early cranberries were less than an average crop and late ones suffered severely from the unprecedented frosts of the 22d and 23d, some bogs not being worth picking.

Harwich (AMBROSE N. DOANE). — Corn is a fair crop: Rowen and fall feed are up to the usual average. There is not much fall seeding done here. Onions are not a good crop, owing to damage by maggots. Potatoes are a good crop in quality and quantity. All fruit is a fair crop except cranberries, but the frost the night of the 22d damaged late fruit 50 per cent.

Truro (D. E. PAINE). — Indian corn is not raised here. Rowen and fall feed are up to the usual average. Very little fall seeding has been done. Potatoes have made a fair yield and are of good quality. The prospect is fair for root crops, celery and other late market-garden crops. There will be a light crop of all kinds of fruit.

DUKES COUNTY.

West Tisbury (GEO. HUNT LUCE). — Indian corn is an average crop. Rowen and fall feed are above the average in condition. Potatoes are rotting badly. The prospect is good for root crops, celery and other late market-garden crops. Fruit has been ruined by a fierce gale and cranberries have suffered from the severe frost.

BULLETIN OF MASSACHUSETTS BOARD OF AGRICULTURE.

BREEDS FOR THE FARM AND FARMERS AS POULTRY BREEDERS.

By JOHN H. ROBINSON, *Editor "Farm-Poultry," Boston, Mass.*

When I was a boy in Illinois thoroughbred fowls were rare, and even less frequently found on farms than elsewhere. But there was one thing about the farm flocks in those days that I often think of with regret,—in the improvement of poultry stocks that feature has been lost,—the fowls in each flock and the flocks throughout each community were, in general, very much alike.

To be sure there was not the uniformity one finds to-day in a lot of selected specimens from a stock of well-bred birds. The best specimens were not to be compared with the finest developed specimens of to-day for either color, shape or size. Yet I am inclined to think that, aside from the matter of color, the average farm flock of those days was more uniform than even the average fancier's flock of to-day, and there are some breeds now popular for which I would not except color either. Observe that I do not claim that the flocks of the old days were as good as those of to-day,—only that they were more uniform.

It is to be regretted that in the improving of flocks, which has followed the introduction of new breeds, uniformity in flocks and of the flocks in the same section have so seldom been retained. There have been so many new and improved breeds to select from that as soon as people began to go outside of their own immediate neighborhood to get new blood, and to try to introduce blood that would improve their flock, those who had before used the same kind of stock began to use some very different stocks; and as they still continued exchanging "roosters" and eggs with their neighbors, the result was that the flocks often became fearfully and wonderfully mixed. The poultry stocks of the country, considered as a whole, continue so. There are here and there farming localities where nearly all farmers keep the same kind of fowls, and in some sections flocks of certain breeds are much more numerous than elsewhere, but there is not anywhere such greater uniformity and better general excellence as might reasonably be expected after two-thirds of a century of improvement.

That this last statement is not in accordance with general ideas I am well aware. Any one who will consider the lack of uniformity in the poultry found in the ordinary farm flock as well as in the ordinary town

flock, and who will observe the small proportion of only fair-sized fowls, must admit that there are grounds for it. We need not, however, depend merely on observation. Here is an illustration. A few years ago I had a lot of Light Brahma hens I wanted to sell in a bunch, and at once, in order to get them out of the way. I could not sell them to any of the local buyers because they were too large for their trade, so I asked a buyer in a section the other side of Boston, where Brahmas were bred more than any other fowl, if he could use them. He agreed to take them, and turned the deal over to a Somerville buyer who sometimes made trips to my town.

The lot of hens sold weighed at this time only a little over seven pounds apiece, live weight. They had been laying heavily for between six and seven months and were not in good condition. Four months before they were sold they would have averaged better than nine pounds, many of the hens weighing when in good condition ten to ten and a half pounds. When the man who came for them was weighing them he remarked that they were the heaviest and largest hens he had had for a couple of years.

Talking about weights of poultry, one thing led to another until finally he asked: "What do you suppose is the average weight of the fowls we buy?" I guessed, "About five pounds." "Well," said he, "the most of the hens we get weigh three to three and a half pounds. Hens that weigh four to five pounds we call large hens, and we get very few lots that will average four pounds."

Since then I have taken some pains to learn from other buyers, and to see for myself as I went about among poultry keepers, whether his statements were correct, and I have to conclude that they were, and that the average fowl of to-day is but a slight improvement over the best ordinary fowls of sixty or seventy years ago. Why is it? I think the answer is, there has not been the improvement of poultry generally that there ought to be because the farmer is so seldom a poultry breeder.

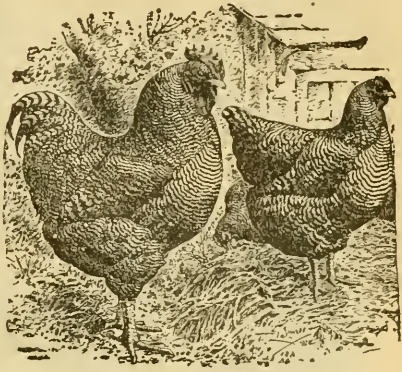
That does not indicate that farmers as a class are different from other poultry keepers. The ordinary poultry keeper, even the ordinary fancier, is not, strictly speaking, a breeder. But inasmuch as the farmer's produce by far the greater part of the country's supply of poultry and eggs (some authorities say nine-tenths of it), what farmers generally do or fail to do with regard to poultry is of vastly more importance than what the rest of the poultry keepers do or neglect to do; for if all the other poultry keepers by general consent should adopt a course which would greatly improve their stocks of fowls, the effect on the whole market product would be small as compared with the results if half or even a third of the farmers were to pursue the same course.

Most people who raise poultry are just poultry *growers*. They hatch the eggs of such stock as they happen to have. They keep on, year after year, reproducing fowls, without any definite ideas as to the particular points of excellence which it would be desirable to establish in their stock. They interest themselves little if at all in the principles of breeding. They follow no definite system. If they use some pure bred stock they give no special attention to preserving its characteristics. Oftener, indeed, such special attention as they give it is in the line of

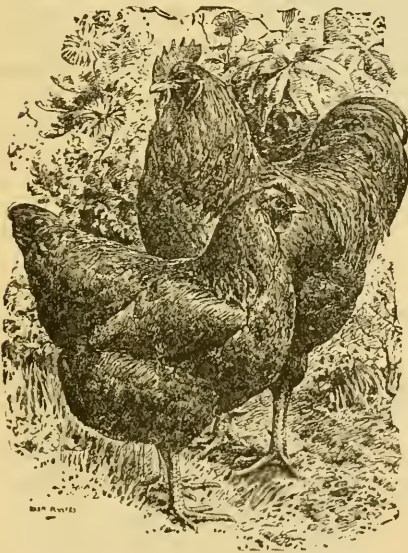
getting rid of whatever fixed character their fowls possess. The average poultry keeper has a perfect mania for crossing breeds, and nearly always he makes crosses without definite ideas about what he is likely to get or what he wants to get. Then not finding the product pleasing he crosses again and again, until, becoming disgusted with his chickens, he either leaves them to breed together by chance or gets some new stock and begins another series of crosses.

Poultry breeding properly consists in the intelligent, systematic mating of fowls to produce progeny having the desirable qualities of the parents preserved and if possible intensified, and the undesirable

qualities either reduced or bred out entirely. A poultry breeder is not necessarily a fancier or a breeder of thoroughbred stock. One who works systematically and persistently for the development of common or grade stock is really more of a breeder than many growers of



PAIR OF IDEAL BARRED PLYMOUTH ROCKS.



PAIR OF IDEAL BUFF PLYMOUTH ROCKS.

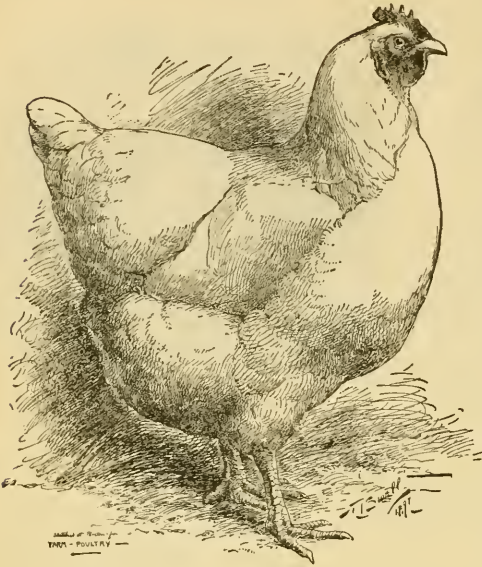
thoroughbred stock. If his ideas are good, and he is reasonably successful in his efforts to realize these ideas in his stock, he accomplishes more than most of those keeping thoroughbreds. I have known, first and last, a good many breeders who have made for themselves, from common stock, flocks of fowls in every practical respect equal to average good thoroughbreds. They were virtually pure bred, as much so as many of the standard bred stocks.

But there are two serious objections to working in this way. The first is that it takes very much longer to accomplish any desired results by breeding from com-

mon stock than by breeding from thoroughbreds. Though, as has been said, many thoroughbreds are by no means all that they should be, it is always possible to get specimens of some popular thoroughbred variety having the qualities one desires well developed, and from such stock as a foundation a careful breeder can accomplish more in three years

than he could in three times as many years if he began with stock of no particular breeding.

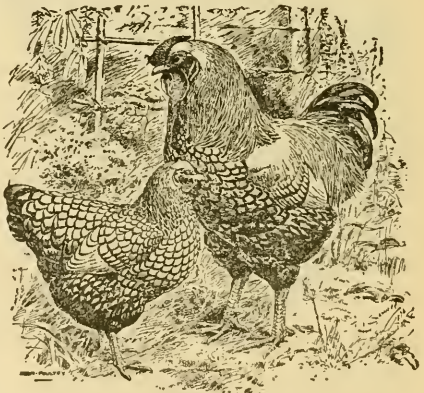
This is a point which has been demonstrated over and over. It is a point which needs to be emphasized often, for one of the most prevalent errors about poultry breeding is the opinion, held by many who have a very good idea of what they want, that they can develop it themselves by the careful improvement of inferior stock more economically than by paying the high prices which it is frequently necessary to give in order to get good stock of the type wanted. I would not advise any one who needed to consider economy — as most of us do — to buy fine breeding



IDEAL WHITE PLYMOUTH ROCK PULLET.

fowls in large numbers at big prices; but it is often the best economy to pay almost an extravagant price for a few good birds to be used as foundation stock rather than give time and attention to the development of a larger flock of less meritorious quality.

The principle is exactly the same as that upon which a farmer or gardener, who wants some of a new variety of vegetable, grain or fruit, so expensive that he does not feel that he can afford to buy it in quantity, proceeds. He buys a small amount and simply uses it as a foundation stock from which to produce seed or plants for a large crop in some future year. He should do the same way with poultry, and should have as much patience in working toward the results he wants.

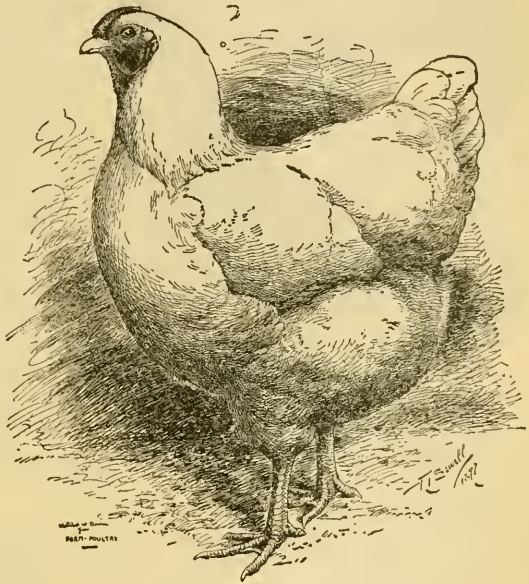


PAIR OF IDEAL SILVER LACED WYANDOTTES.

The second objection to developing common stock is that, in working along lines in which no one else is interested, one almost invariably comes before long to the place where he needs new blood, but as he

cannot get it from stock bred on similar lines, there being no other such stock, he has to either go without new blood or use something different. He has a choice of only two equally unsatisfactory courses. The dilemma is easily avoided by using fowls of a popular breed, in which it is always possible to get some such stock as one wants.

What puzzles the person who wants to get a few good birds to use as foundation stock is where to go to get such stock. He finds many breeders, all claiming to have just what he needs. If he is where he comes in contact with many people who have at one time or another bought stock from these breeders, he is very apt to come across one or more people who tell him of experiences with this, that and the other breeder that make him think he had better not risk an order with any of them. I get scores of letters every year from such people. They write to me supposing that I can tell them all about the different stocks, which is good, which is bad; and about the breeders, who is reliable and who is not. They say something like this: "I have only



IDEAL WHITE WYANDOTTE PULLET.

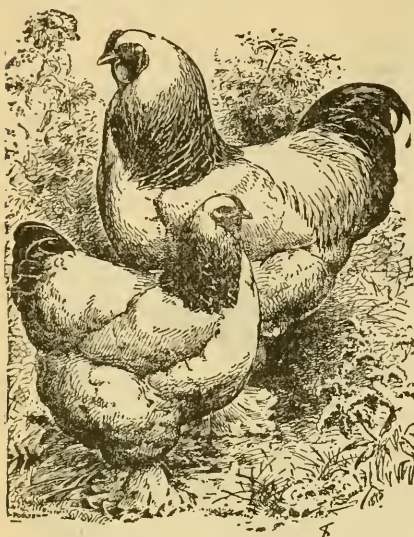
a little money to spend for fowls. I have had to save very carefully to get it, and I cannot afford to buy stock that will not prove satisfactory."

Now I am so situated that I am not at liberty to recommend one man's stock in preference to another, and even if I were at liberty to do so I would be very reluctant to express an opinion as to the best place to buy stock of any particular kind, for I found out long ago that unless you know what kind of stock a man wants, and know that he too knows what he wants, advising him where to buy is too risky. If he is not satisfied with the deal he blames you more than any one else connected with it. I can do better by the man who wants to know where to go to buy by telling him how to buy.

In the first place he must know what he wants. If he doesn't know he must find out before buying, and he must learn it so that he is sure of his knowledge.

To illustrate: suppose a man concludes that he wants fowls for a certain purpose and is told that White Plymouth Rocks would suit him. If he was brought up on a farm he probably does not need to be told that

all White Plymouth Rocks are not alike; for he has seen the production of plants and animals of many kinds and has noticed that individuals from

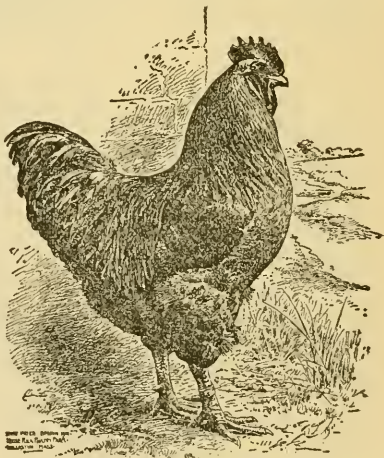


PAIR OF IDEAL LIGHT BRAHMAS.

the same seed or the same parents vary sometimes a great deal. The first step, then, is to learn what is the correct type of White Plymouth Rocks. I think the best way to learn this is by carefully studying a good ideal illustration of a White Plymouth Rock. The ideal drawing represents a bird perfect, according to the artist's interpretation of the ideas of the best breeders and judges, in every section,—a bird free from faults. Sometimes photographs are obtained which are quite as good and look more true to life, but the photograph so often fails to do typical birds justice in their best points, and so often distorts some sections,

that I think it much safer for those who want to learn the best types in the different breeds to study the ideal drawings first, and so learn to make proper allowance for faults in specimens they see, and also in photographs and drawings that are portraits of individual birds, and hence show in some degree the faults of the fowls they represent.

It will help one to appreciate the points of excellence in a breed if he will study, in connection with the ideal representation of it, the authorized description of the variety published in the "Standard of Perfection." This description tells him briefly what the drawing shows him, and by studying the two together he gets a better apprehension of the type than he could from either alone. From book and picture one who had never before seen a White Plymouth Rock could get an idea of it good enough to make it impossible for him to be imposed upon with fowls of different type, or with fowls having serious blemishes.

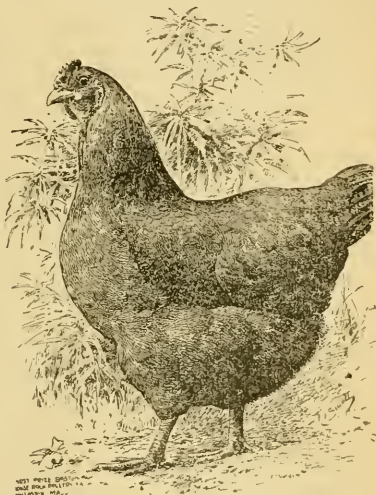


IDEAL SINGLE-COMB RHODE ISLAND RED, MALE.

Even if one is somewhat familiar with a breed it is well for him to justify his ideas of good type by comparing them with approved standards. Theoretically, the way to learn correct types would be by study of the best birds, but in practice the first knowledge of what is right is more surely gained by studying ideals, because forming one's ideas from a model correct in all sections one avoids the common error of learning to overlook readily the weak points which may be associated with special excellence in the best birds they see.

Having learned what a White Plymouth Rock should be the seeker after good stock is now prepared to inspect some stock for the purpose of buying when he finds what he wants. I advise making a personal inspection of the stock from which one buys and personal selection of the birds bought, if that is at all possible.

With the ideal White Rock imaged in his mind the buyer goes into a flock of White Plymouth Rocks and begins to look for specimens resembling that ideal. He knows that the type he is looking for is a rather long and deep-bodied bird, full breasted, neither too low nor too high on the legs to look symmetrical. The picture he has studied has given him an idea of the general appearance and carriage of the bird, and if he has any eye for outline he will at once single out of an ordinary flock some birds as typical and some as not typical. These typical birds, if on closer inspection they are found free from serious faults, and if they are vigorous and healthy looking, are the kind of



IDEAL SINGLE-COMB RHODE ISLAND RED,
FEMALE.

birds he wants and he should take no others. He should pay any price in reason for specimens of the right general type rather than take as a gift specimens not of that type.

The fowls being satisfactory in appearance, the buyer, naturally, wants to know something of their laying capacity. For this he must usually take the seller's word, but if it is convenient for him to visit the place a few times before buying and notice the eggs in the nests he can form a tolerably good estimate of the general laying capacity of the stock, and get accurate knowledge as to how the eggs run for size, shape and color. If, as may happen, he fails to find any specimens in the flock that strike him as typical, the thing to do is to postpone buying until he can satisfy himself whether his judgment of the stock was right or not.

If he cannot buy White Rocks at home, it would be well worth his while to visit yards elsewhere in his quest for stock, and not under any consideration to buy until he can get what he wants. Even if he is

unable to personally select his stock he can protect himself in buying from a breeder at a distance by carefully stating what he wants and insisting that fowls be shipped him on approval. If he takes the necessary precautions to protect himself at every point from his own inexperience as well as from the possible disposition of some with whom he deals to take advantage of his inexperience, a man runs little risk of parting from his money for fowls that are not what he requires. The risk cannot be absolutely eliminated but it can be so reduced that the buyer is reasonably safe from loss. It may take him some time to find what he wants and to get started, but the delay is not lost time if he is learning to buy on his own judgment, for as a rule one has to learn to do that before he gets fairly started in breeding poultry, and it is much better and more economical to learn before buying than to learn by buying what you do not want.

Another point comes up here. Suppose one makes a fruitless search for fowls of the kind he had decided he wanted,—cannot run across birds that suit him,—but in the meantime does find birds of another variety that seem to him to be just what he wants; should he drop his first choice and take the others? Supposing a case as stated I would say yes. The fowls which suited might not be the best type of their kind according to prevailing opinion, but if they are what is wanted the name by which they are called and their superficial points are of only minor importance. While I have used the White Plymouth Rock in the illustration above, any other Plymouth Rock is the same in everything but color. The Wyandottes and Rhode Island Reds are in the same class and differ practically from the Plymouth Rock principally in size and shape, and not radically in either of these respects. Ordinarily a Massachusetts or New England farmer would not want to go outside of these three breeds to look for stock. Indeed, this is the class of stock best adapted to the wants of most poultry keepers everywhere, and as a rule the preference of a poultry keeper for any particular variety of this class is due to his having happened to get stock of that variety which suited him.

A brief comparison of the three breeds and their varieties will indicate how like they are in essential qualities, and also show the superficial differences which would sometimes be considered in making a choice, and which in a few cases do have a marked influence in determining the popularity of the variety.

All are medium-sized fowls, the Plymouth Rocks as a class a little larger than the others, and a little longer in coming to maturity.

Of Plymouth Rocks there are three varieties, Barred, White and Buff. Unless he had a color preference, a taste for appearance to satisfy, it would make no difference to the poultry keeper who wanted a fowl of the Plymouth Rock type which of the three varieties he took.

In Wyandottes the number of varieties is greater, and most of them are more difficult to produce in such uniformity of color as will satisfy even a moderately critical taste. The White and Buff Wyandottes are the only varieties of the breed in which the farmer looking for stock would do well to take stock if he found what he wanted. Of the other varieties the Golden Laced, Silver Laced, Partridge, or Golden Pencilled, and Silver Pencilled are difficult to breed, and the farmer who is not

something of a fancier would not long be suited with them. The Black Wyandottes are comparatively rare and their color does not recommend them to many practical poultry keepers. The Columbian Wyandotte, with markings of a Light Brahma, should make a first-class variety for the farm. The present objection to recommending it generally is that the breed requires very careful breeding to bring it to such stage of color development that the average novice in handling the variety will get encouraging results in that feature. Of course the novice in handling any variety, as in doing work of any kind, makes mistakes at first. It takes a year or two of experience in breeding to learn to avoid the most serious mistakes. But the poultry keeper who wants to make himself a good breeder of fowls will succeed better by beginning with well-established varieties, because then his first and hardest years' works are not made more difficult by lack of development or permanence of the special characteristics of the varieties he is working with.

The ideal Rhode Island Red is of a type intermediate between the ideal Plymouth Rock and Wyandotte type, but comparatively few specimens have yet been produced showing that type conspicuously. The average Rhode Island Red resembles the average Wyandotte more than it does the Plymouth Rock. There are two varieties, the Rose Combed and the Single Combed. A third variety, Pea Combed, like a Brahma, is bred by a few breeders but has not attained a popularity at all comparable with that of the other two, which in many sections of New England seem to have matched the popularity of the popular varieties of the Plymouth Rocks and Wyandottes.

For usual farm conditions in this country no other breeds need be considered. In the section where soft roasters for the Boston market are grown on a large scale Light Brahmas are very generally kept by farmers to supply growers of this class of poultry with eggs for hatching.

Having obtained stock suitable for his requirements the farmer is ready to begin his work as a poultry breeder. The difficulty of getting just such stock as he wanted will generally have convinced him by this time that there is not near as much of it produced as there ought to be. There ought not to be any considerable proportion of the poultry produce each year that did not in a general way fill most of the requirements for a good fowl for the farmer. Allowing for differences in size and in purpose it is still true that whatever the variety or whatever the purpose in breeding them the aim should be to produce well-developed, healthy, vigorous fowls, and that these points should always be considered first.

For the fancier, to whom superficial qualities, such as perfection of comb or crest, or excessive development of foot feathering, or accurate markings, or purity of color, seem of prime importance, and really are made so in the competitions for which his birds are produced, we can find some excuse for sacrificing the substantial qualities of fowls to the superficial, or for being so impressed with features that are for the time being a fad that he neglects the preservation and development of useful characteristics; but the farmer, as a breeder, has no excuse for not developing in his fowls the qualities of most value to him, and having once clearly apprehended for himself what these qualities are, all his efforts as a breeder should be directed to making them uniform in his flocks.

It does not take long to do this if he can bring himself to adhere rigidly to the fundamental rules of good breeding, *i.e.* : —

First. — To breed only from the best obtainable specimens ; following this rule year after year, demanding that his breeding stock as individuals shall have the merit he seeks in themselves as well as in their ancestors.

Second. — To give the chicks of his breeding stock the care and food necessary to make them attain their best possible development.

In a previous article on poultry keeping for the farmers of Massachusetts I had occasion to refer briefly to the fact that as a rule farm grown stock did not attain the best development possible. I would not go so far as to say that the best development is to be sought for all the stock produced on the farm, regardless of the cost of obtaining it, though I think better development than is usual could be obtained on many farms at an insignificant cost, but I would by all means urge every farmer who wishes to improve his poultry to give all the attention to chickens from which his stock birds will be taken that they need to bring out all the merit there is in them.

Beginning with good stock, breeding carefully and growing his fowls well, a farmer can in a very few years have a stock of uniform high excellence that will be an ornament to his farm, will be far more profitable than the old, carelessly bred stock, will be a source of pride to him and stimulate his neighbors to follow his methods.

And here we come naturally to the consideration of another point, — the relation of the farmer as a breeder to other farm poultry keepers, especially to those in his immediate vicinity. It is of quite as much advantage to him to have his neighbors generally keeping just as good fowls as the fowls he has improved to his liking. One may take a selfish sort of pride in having better poultry than those about him, but it is not really much to his credit unless they too have good poultry. It is to the advantage of the farmer and breeder of poultry also to have the kind of poultry he keeps popular throughout his vicinity. I doubt whether there is any one condition affecting the improvement of poultry which has a surer and steadier influence for the preservation of practical qualities than to have the stock almost universally kept in a locality, and all the poultry keepers alike interested in getting practical and profitable results.

It remains to speak of the satisfaction of breeding poultry. The mere grower of poultry gets little pleasure out of his work with it. The breeder always finds something in his work to compensate for the drudgery of some of the tasks of caring for poultry. His fowls begin to assume an individuality in his sight and in his thought. Each succeeding year he becomes more adept in anticipating the quality of the chickens he will hatch, even though he may make no progress in counting them before they are hatched. Nor is the use of what he gains by intelligent efforts in breeding poultry limited to his work with poultry. In learning to work with the principles of breeding he is providing himself with a better equipment for every other branch of his farm work, for the same general principles of production run all through the animal and vegetable kingdoms.

MASSACHUSETTS CROP REPORT

FOR THE

MONTH OF OCTOBER, 1904.



BEE KEEPING.

*ISSUED MONTHLY, MAY TO OCTOBER, BY STATE BOARD OF
AGRICULTURE, STATE HOUSE, BOSTON, MASS.*

J. LEWIS ELLSWORTH, *Secretary.*

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CROP REPORT FOR THE MONTH OF OCTOBER, 1904.

OFFICE OF STATE BOARD OF AGRICULTURE,
BOSTON, MASS., NOV. 1, 1904.

Bulletin No. 6, Crop Report for the month of October, is presented as the final issue of the season. We wish to thank our correspondents for their free and faithful assistance, through which we have been able to publish these reports, and trust that they will all be able to serve us in the same manner another year.

The special articles printed this year have been: Bulletin No. 1, "The hay crop in Massachusetts," by Prof. Wm. P. Brooks; Bulletin No. 2, "The growing of mushrooms," by Dr. Geo. E. Stone; Bulletin No. 3, "The gypsy and brown-tail moths," by A. H. Kirkland, M.S.; Bulletin No. 4, "Harvesting and marketing apples," by Prof. F. A. Waugh; Bulletin No. 5, "Breeds for the farm and farmers as poultry breeders," by John H. Robinson.

We wish to call attention to the article at the close of this bulletin on "Bee keeping; how to meet its dangers and difficulties," by Burton N. Gates. This article is in a measure supplementary to that published last year on the pleasures and profits of bee keeping, and contains information of great practical value to all those interested in bees.

PROGRESS OF THE SEASON.

The monthly report of the Chief of the Bureau of Statistics of the United States Department of Agriculture (Crop Reporter for October, 1904) shows the average condition of corn October 1 to have been 83.9, as compared with 84.6 a month earlier, 80.8 in 1903, 79.6 the year previous, and a ten-year average of 78.3.

The preliminary estimate of the average yield per acre of spring wheat is 12.7, and the average quality 75.7, as compared with 85.5 in 1903.

The preliminary returns indicate an average yield of 32.1 bushels of oats per acre, as compared with 28.4 bushels a year ago, 34.5 in 1902, and a ten-year average of 28.2.

The preliminary estimate of the yield per acre of barley was 27.2 bushels, against 26.4 a year ago, 29 in 1902, and a ten-year average of 24.3.

The preliminary estimate of the yield per acre of rye was 15.2 bushels, against 15.4 last year, 17 in 1902, and a ten-year average of 15.

The average condition of buckwheat on October 1 was 88.7, as compared with 91.5 a month earlier, 83 in 1903, 80.5 in 1902, and a ten-year average of 80.7.

The average condition of tobacco was 85.6, as compared with 83.7 a month earlier, 82.3 in 1903, and a five-year average of 78.9.

The average condition of potatoes was 89.5, as compared with 91.6 a month earlier, 74.6 in 1903, 82.5 in 1902, and a ten-year average of 73.5.

In Massachusetts the average condition of corn October 1 was 90; the average yield of oats 34, and the quality 92; the average yield of rye 17, and the quality 94; the average condition of buckwheat 94; the average condition of tobacco 100; the average condition of potatoes 89; the average condition of apples 83; and the average condition of grapes 79.

MASSACHUSETTS WEATHER, 1904.

(Compiled from data furnished by the New England Weather Service.)

The weather of January was unusually severe, with cold waves of marked intensity, heavy and frequent storms, gales of great force, and snowfall of unusual depth. The monthly mean temperature was decidedly below the normal, being 8° below in interior portions of the State. The total snowfall for the month ranged from 4 inches on the coast to about 50 inches in some interior sections. As a whole January may be considered one of the most severe months of the last century.

In February the monthly mean temperatures were again below the normal at all stations, the snowfall in excess of the average, though below the preceding month in amount, and the month was also characterized by severe and persistent storms along the coast, during which the wind blew with great violence. The month was a fitting climax to a winter that, so far as temperatures are concerned, is unprecedented in the official records.

In March the temperature at most points was below the average for the month, but with deficiencies less marked than in the preceding months. The same was true of the precipitation, mostly in the form of snow. The storms of the month were less severe and fewer in number than usual. The month closed with moderate weather, during which the snow disappeared, except in protected places, giving conditions favorable to the beginning of farm operations.

April was very unpleasant, the weather being unusually cold and wet. With slight exceptions the month was the coldest of its name on record. The precipitation was remarkably heavy, though well distributed through the period and over the territory. The monthly amounts were among the largest recorded for April. At the close of the month the season was generally estimated to be from ten to fifteen days behind the average.

The opening week of May was clear and sunshiny, with almost an entire absence of rainfall and temperatures generally above the seasonal average, the days being quite warm and the nights cooler than usual. Rain on the 9th and 10th was followed by several days of unsettled but generally fair weather, ending with copious rainfall on the 19th. The temperature varied but little from the normal. The weather of the remainder of the month was characteristic of the season; clear to partly cloudy skies, with well-distributed showers. The temperature of this period was continuously above the average. May as a whole was a very pleasant month, the weather being well suited to farm operations.

The weather of June was marked by an abundance of sunny days and a deficiency of rainfall. In a few sections there were violent local storms, but over the greater part of

the State there was need of rain at the close of the month. General light rains on the 29th and 30th practically broke the drought. A conspicuous feature was the rather low temperature during the days and uniformly and exceptionally cool nights. The daily mean temperatures were below the seasonal average continuously, the 5th excepted, until the 17th, but during the closing decade were near the normal. The monthly rainfall was little more than half the usual amount, but was well distributed through the period, so that the effect of the deficiency was less marked than would otherwise have been the case. Excepting the low temperatures, the weather of June was very pleasant.

July was notable for conditions near the seasonal in precipitation, temperature and sunshine. The precipitation, though below normal, was so well distributed that the deficiency was hardly noticeable. Thunderstorms were less frequent than usual, but in some sections unusually violent. The temperature was remarkable for equable distribution and uniform high range of the maxima and minima, with an absence of extremes in both. Some quite warm weather was experienced in interior sections, and on the coast there were several days of muggy, oppressive weather, though the maximum temperature was under 90 degrees. Viewed as a whole, July was a very pleasant month.

August opened with several days of warm, showery weather, with muggy, oppressive atmospheric conditions. A week of cool weather, with scattered showers, followed. During the remainder of the month the weather was marked by periods of a few warm days, alternating with like periods of cool weather, with the mercury considerably below the average. The outcome was a monthly mean considerably below the normal. The precipitation was below the average from 20 to 30 per cent, but was quite equably distributed, so that there was little complaint of drought. Local storms were less frequent and violent than usual during August. The weather was very pleasant, with a notable deficiency of hot, humid days frequently characteristic of August.

September will go on record as a month of unusually few rainy days, with abundant sunshine, but with a heavy total

rainfall. During the first decade there was very little rain, but on the 14th and 15th a downpour that has been but seldom equalled, with almost an entire absence of rain during the remainder of the month. The temperature records also show pronounced extremes. The maxima ranged in the 80s on a number of days, with muggy, oppressive temperature, and on the 22d and 23d dropped suddenly to points ranging from slightly above freezing in some sections to several degrees below in others. The monthly mean temperature did not depart greatly from the normal. Notwithstanding these unusual conditions September, considered as a whole, was a pleasant month.

WEATHER OF OCTOBER, 1904.

The opening days of October and until the 8th of the month were generally pleasant and with abundant sunshine. A week of overcast weather followed, during which more or less rain fell in about all sections. Fair weather, mostly with clear skies again obtained, and continued through the 18th followed by a wide-spread storm of much intensity on the 20th and 21st. During this storm the winds along the coast attained hurricane force and caused considerable loss of life and of shipping, and much damage to shore and other property. The weather was fair and very pleasant through most of the remaining days of the month. The temperature ranged below the seasonal average, with the exception of a few days, until the 15th, the daily deficiency being about 3 to 4 degrees. There was a warm period from the 16th to the 22d inclusive, during which the mercury averaged 5 degrees above normal. The weather during the rest of the month was rather cooler than the average. Taking the month as a whole the temperature did not depart greatly from the normal for October. While rain fell on about the average number of days the monthly amounts were much below the average, and in many sections were little if any above half of the normal October rainfall. Generally speaking, the weather of October was favorable to farming operations, *i.e.*, to fall plowing and seeding, and to securing and housing crops.

CROPS OF THE YEAR.

The wet weather of May delayed farm work and at the close of the month it was somewhat in arrears. Pastures and mowings wintered well, as a rule, secured a good start, and at the close of the month the prospect for grass was never better. Fall seeding generally wintered well and got a good start. The apple bloom was unusually heavy. Peach trees were badly winter-killed and bloomed only in a few localities; cherries and plums made a full bloom, but there were some complaints of a light bloom on pears. Few insects appeared and did but little damage. Spraying is generally practised by fruit specialists and growing in favor with farmers. Farm help was fairly plenty; average wages, \$20 per month with board, and \$1.50 per day, or higher, without board. There was a slight increase in the acreage of potatoes.

Insects did less damage than usual in June. Indian corn was reported as small and backward, but of good color and otherwise thrifty. Haying was just beginning, at time of making returns, with the crop not more than an average one, the damage from winterkilling being more serious than was expected. The acreage of early potatoes was considerably increased, with crop somewhat backward, but generally promising well. Early market-garden crops generally made good yields and brought prices fully up to the average. The flow of milk was well maintained, with prices for dairy products showing a tendency to seek a lower level. Dairy cows were somewhat more plentiful than usual, with prices easier. Pastures were generally in good condition. Strawberries were a fair crop. Plums and cherries promised good yields. Apples set well and promised well.

In July insects did very little damage. Indian corn was still backward, but coming forward rapidly and very promising. Much of the crop is used for ensilage. Haying was practically completed, the crop exceeding expectation and being above average in quantity, and of excellent quality. The amount of forage crops planted was slightly less than usual, but all promised well. Market-garden crops showed unusually good yields, with prices lower than usual, but not

too low for profit. Few early potatoes had been dug, but the crop promised well. Returns did not indicate that the apple crop would be up to the average of a bearing year. Pears promised but a light crop; plums a heavy crop; peaches much below the normal; grapes promised well; cranberries much below average, owing to late frosts and hail. Pastures were reported as short and dry in some sections, but the rains of the closing days of the month corrected this condition. Rye, oats and barley were reported to be unusually good crops.

Indian corn continued somewhat backward during August, but was earing well and promised a good crop unless killing frosts came at an unusually early date. Rowen promised more than an average crop and would have been even better save that the first crop was cut too late on many fields. Potatoes were somewhat backward, but the vines were very heavy and a good crop promised, though blight was general in eastern sections, with some complaints of rot. The acreage of tobacco was little changed and one of the finest crops ever secured was in prospect. Pastures have seldom been in better condition. Apples promised a good crop; pears light; plums generally yielded well; peaches almost a failure; grapes fair to good; and cranberries light, owing to frosts, hail and insect damage. Oats gave a very good crop, with barley unusually good as a forage crop and little raised for grain.

Uncut corn was severely damaged by frosts on September 22d and 23d, but where well matured and cut in advance of the frost it was generally well cared and of excellent quality. More than an average crop of rowen was secured, and fall feed was in excellent condition in most sections. Less fall seeding than usual was done, but where put in early a good catch was reported. Onions were considerably below a normal crop, though perhaps better than previously expected. Potatoes would have been an unusually heavy crop but for rot, but will be somewhat below the normal in yield. Root crops generally promised well, though there were some complaints of injury from frost. Celery and other late market-garden crops promised well. In the western counties an

extraordinarily heavy crop of apples was reported, but in central and eastern sections it was somewhat light as a rule. Pears were a fair crop; peaches very few; grapes good, but injured by frost; cranberries suffered still further from the frosts and will be one of the lightest crops of recent years.

In the circular to correspondents returnable October 24 the following questions were asked:—

1. What is the value of the corn crop compared with a normal crop?

2. Have root crops proved to be average crops?

3. What is the condition of farm stock?

4. What is the condition of fall seeding?

5. How have prices for crops raised for market compared with former years?

6. Which of the leading crops in your locality do you think have been most profitable?

7. Which of the leading crops in your locality do you think have been least profitable?

8. Considered as a whole, has the season been a profitable one for your farmers?

Returns were received from 132 correspondents, from which the following summary has been made:—

VALUE OF THE CORN CROP.

At the opening of September Indian corn had made a fine growth of stover, was eared out fairly well, but needed a month of ripening weather to secure best results, as a considerable proportion of the crop was backward, owing to late planting, poor germination of first planting and cool nights. That which was well ripened and harvested prior to the heavy frosts of September 22 and 23 gave a fine crop both of grain and stover. Enough was injured by the frost or cut before properly ripened to avoid the frost so that the value of the crop was greatly reduced. What would, without killing frosts, have been a crop considerably above the normal in value turned out to be something below, results varying greatly in different sections, so that a more definite statement is impossible. Ensilage corn was more generally secured in good order than was that raised for grain.

ROOT CROPS.

Root crops are generally reported to be good average crops, or a little above, and where raised for market are bringing at least average prices. Potatoes rotted badly in some sections, but where rot did not occur have given a very heavy yield and proved to be a profitable crop, though bringing less than average prices. Celery is a good crop, so far as reported on.

FARM STOCK.

There has seldom been a year when pastures have been in such uniformly good condition over the State and throughout the season. Fall feed is also reported as good in pastures and mowings. As a result farm stock is going to the barns in good flesh and with a good flow of milk, not a single complaint of really poor condition having been received.

FALL SEEDING.

Less fall seeding than usual appears to have been done, but that put in early made a good catch and with favorable weather has come forward very rapidly and is now in first-class condition. Late seeding also appears to have made a good catch and to be as forward as could be expected.

PRICES.

Prices for crops raised for market appear to have a lower trend than for the past few years, due in a large measure doubtless to uncommonly heavy yields in many of the leading crops. Of the 131 correspondents answering this question, 20 speak of prices as higher than usual, 7 as good, 59 as average and 43 as lower than usual. Prices for market-garden crops have generally ruled lower than usual, as have potatoes and apples, while dairy products and poultry products have ruled as high or higher than usual.

MOST PROFITABLE CROPS.

Sixty-six correspondents, a bare majority, consider hay to have been among the most profitable crops; 44, potatoes; 16, corn; 11, tobacco; 8, sweet corn; 7, onions; 7, cab-

baggage : 3, cranberries ; 3, cucumbers ; 3, milk ; 3, strawberries ; 3, tomatoes ; 3, asparagus ; 2, beans ; 1, turnips ; 1, ensilage corn ; 1, oats ; 1, rye ; 1, buckwheat ; 1, market-garden crops ; 1, squashes ; 1, forage crops ; 1, lettuce ; 1, cauliflower ; 1, peaches ; 1, apples ; 1, poultry products ; and 1, beets.

LEAST PROFITABLE CROPS.

Forty correspondents, less than one-third, report that apples are among the least profitable crops ; 31, potatoes ; 22, corn ; 8, cabbages ; 6, onions ; 6, squashes ; 4, tomatoes ; 3, barley ; 3, rye ; 3, beans ; 2, oats ; 2, turnips ; 2, sweet corn ; 2, peas ; 1, buckwheat ; 1, beets ; 1, dandelions ; 1, hay ; 1, market-garden crops ; 1, cranberries ; 1, milk ; 1, grapes ; 1, pears ; 1, plums ; and 1, peaches.

PROFITS OF THE SEASON.

The present season gives somewhat mixed results, but may be said to be a profitable one for our farmers as a whole, as good crops have generally been secured, and prices, except for apples and potatoes, have ranged well up to those usually received. Market-gardeners generally had a profitable season, though not as good as last year. Dairy-men generally did well and go into the winter with well-filled barns and stock in good condition. Poultry raisers received good prices for their products, and of our specialists the horticulturists have perhaps the most cause to complain, owing to the damage to peach trees from the severe winter and the low price of apples, combined with the high price of barrels, this fall. Of the 132 correspondents answering this question, 64 consider the season to have been a profitable one, 32 fairly profitable, 19 an average season for profit, while 8 think that it has hardly been an average season for profit and 15 that it has not been a profitable one.

NOTES OF CORRESPONDENTS.

(Returned to us October 25.)

BERKSHIRE COUNTY.

West Stockbridge (J. S. MOORE). — Indian corn is a good crop. Root crops are much better than last year, and taken all together above the average. Farm stock is looking well, as fall feed has been good. Fall seeding is looking as well as usual. Grain has brought better prices than last year, but potatoes and root crops have been lower because of large yields. Buckwheat has been our most profitable crop, as there is a local market for all that is raised and it commands a good price this year. Apples are our least profitable crop owing to low prices, many giving them away to any one who will harvest them. The season has been a profitable one, our farmers being blessed with good markets for all kinds of farm produce at Lenox and Stockbridge.

Stockbridge (F. A. PALMER). — Indian corn was a poor crop, owing to poor seed and cold, wet weather. Root crops are up to the usual average. Farm stock is in fine condition. Fall seeding is now looking well. Prices for crops raised for market have been a little above the average. Potatoes were a fine crop, but rotted very badly. Apples are in great abundance and barrels high and hard to get, so that many fine apples will rot on the ground. Hay and rye have been our most profitable crops and potatoes and corn our least profitable ones. The season has been a fairly profitable one to our farmers.

Washington (E. H. EAMES). — Indian corn is better than for the last two or three years. Root crops are up to the usual average. Farm stock is in good condition, better than last year. No fall seeding has been done in this locality. Prices for crops raised for market have been about the same as in former years. Potatoes and corn have been our most profitable crops and buckwheat and barley our least profitable ones. Considered as a whole, the season has been about the same as usual for profit.

Peru (F. G. CREAMER). — Corn is a full crop in value. Root crops are up to the usual average. Farm stock is in good condition. No fall seeding has been done here. Prices for crops raised for market have ruled above the average, considering the

large crops. Hay, potatoes and turnips have been our most profitable crops and oats, barley and rye our least profitable ones. Considered as a whole, the season has been a profitable one for our farmers.

Hinsdale (THOS. F. BARKER). — Corn is above the normal in value. Root crops are up to the usual average. Farm stock looks well. Fall seeding is in extra good condition. Potatoes bring lower prices than last year. Hay and oats have been our most profitable crops, and vegetables our least profitable ones. The season has been a profitable one, as crops are above the general average. The month has been very favorable to farm work.

Cheshire (L. J. NORTHUP). — Indian corn is fully 40 per cent below the normal in value. Root crops are 20 per cent above the average. Farm stock is well up in condition, better than for average years. Fall seeding is looking well. Prices for crops are well sustained, except for cabbages, which are very plenty and sell six for 25 cents. Hay has been our most profitable crop, and potatoes our least profitable one, owing to low prices received. The season has been a profitable one for our farmers and they have no good reason to complain.

Williamstown (S. A. HICKOX). — Corn did not fully mature, owing to the cold season. Root crops are fine crops. Farm stock is in fine condition. Fall seeding never looked better. Prices have been less than usual for crops grown for market, as there has been an over production of potatoes, apples and all garden truck. Ensilage has been our most profitable crop and potatoes our least profitable one. The season has been a fairly profitable one.

FRANKLIN COUNTY.

Rowe (F. W. WOFFENDEN). — Indian corn is about 60 per cent of a normal crop. Root crops are fully up to the usual average. Stock is looking quite well as a rule. Fall seeding is in very good condition. Prices for crops raised for market range from 10 to 20 per cent below the usual average. Potatoes have been our most profitable crop and corn our least profitable one, owing to the severe freeze before cutting. Considered as a whole, the season has been fairly profitable. The apple crop is nearly harvested, more than half the crop being ruined by freeze and wind; winter fruit not moving at all as yet.

Charlemont (J. M. J. LEGATE). — The corn crop is below the average in value, a large part of it not getting fully ripe. Root crops are up to the usual average, but potatoes are rotted badly.

Farm stock never looked better, pastures having been good all summer. Fall seeding was never in better condition. Prices for crops raised for market are fully up to the average and I think a little above. Hay has been our most profitable crop and corn our least profitable one, where raised for grain. The season has been a profitable one, crops as a rule having been good and prices above average.

Hawley (C. C. FULLER). — Indian corn was a good crop, but suffered severely from frost. Root crops are up to the usual average. Fall seeding is in good condition. Farm stock is in about average condition. Prices for crops raised for market have ruled rather low. Potatoes have been our most profitable crop and apples our least profitable one. The season has been about a normal one for profit, taken as a whole.

Ashfield (CHARLES HOWES). — Corn is about two-thirds of a normal crop in value. Root crops are fully up to the usual average. Stock is in very good condition. Fall seeding is now looking finely. Prices for crops raised for market have hardly been up to average years. Hay is our leading crop and has been our most profitable one. As it looks now the apple crop will be the least profitable one this season. The season has hardly been an average one for profit, as this is a dairy town and grain has been too high for the price of dairy products.

Whately (FRANK DICKINSON). — Indian corn is not over two-thirds of a full crop in value. Root crops are not up to the usual average. Farm stock is below the average in condition. Fall seeding is late but is coming on well. Crops raised for market have brought average prices. Tobacco has been our most profitable crop and corn our least profitable one. Considered as a whole, the season has been a profitable one for our farmers.

Montague (C. S. RAYMOND). — Indian corn is about 80 per cent of a full crop. Root crops are up to the usual average. Farm stock is in very good condition. Fall seeding is looking well where sown early. Prices for crops raised for market have ruled about the same as usual. Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole, the season has been a profitable one for our farmers.

HAMPSHIRE COUNTY.

Amherst (WM. P. BROOKS). — Both field and ensilage corn made a normal growth, but were poorly ripened. Root crops are above average, carrots and mangels being especially good. Farm

stock is in excellent condition. Fall seeding is in good condition. Prices for crops raised for market rule rather below the average, except perhaps for onions and tobacco, for which good prices are paid. Tobacco, onions and hay have been our most profitable crops and corn our least profitable one. The season was a very good one for most farmers, as nearly all crops are good, with prices for most fair and for some above the average. The heavy winds of the first part of the month did great damage to the apple crop, from one-third to one-half being blown from the trees. This storm, coupled with the high price of barrels and the low price of apples, has rendered the crop less profitable than was anticipated.

Hadley (H. C. RUSSELL). — Indian corn is three-fourths of a normal crop in value. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in excellent condition. Onions and tobacco have been our most profitable crops. Onions have sold at from 50 to 60 cents per bushel and are about all sold with a fairly good yield. Tobacco is selling at from 16 to 19 cents per pound in the bundle, a price below the expectations of farmers considering the quality, but at good paying prices. Apples have been our least profitable crop. The season has been a profitable one for our farmers.

Easthampton (WM. E. CLAPP). — Corn is about three-fourths of a normal crop. Root crops are up to the usual average. Farm stock is in fine condition. Fall seeding is below the normal in condition. Prices for crops raised for market have ranged as high as usual. Tobacco, as far as sold, has been our most profitable crop and onions our least profitable one. Considered as a whole the season has been a profitable one. Potatoes yielded well, but were considerably damaged by rot. Corn needs two or three weeks more to mature, although there have been some very nice yields.

Southampton (C. B. LYMAN). — The corn crop was very good, although the early frost damaged some pieces severely. Root crops gave large yields. Some rot in potatoes but not general, and they are bringing fair prices. Farm stock is in very good condition. Fall seeding is in better shape than usual. Crops raised for market are fully up to the average in price. Tobacco, grass and corn have been our most profitable crops. Apples were a good crop but suffered severely from winds, and at going prices many think it will hardly pay to gather them. Dairy products are fully up to the average in price. On the whole the season has perhaps been a profitable one, but with the high price of help it is difficult to make a profit.

Chesterfield (HORATIO BISBEE). — Corn made a large growth, but failed to ripen well. Root crops are up to the usual average; potatoes a good crop with most farmers, while some have lost by rot. Farm stock is looking well and dairy cows are in good demand. Fall seeding has made a good start. Prices for crops raised for market have compared well with former years. Potatoes have been our most profitable crop and corn our least profitable one. Apples are very plenty and many will not be picked. Considered as a whole, the season has been a profitable one.

HAMPDEN COUNTY.

Blandford (ENOS W. BOISE). — As corn is husked many soft ears are found and the crop is not as good as was expected, not over 80 per cent of the normal. Root crops of all kinds are proving extra good. Pastures having been good throughout the season, farm stock comes to the barns in good shape. Fall seeding is in good condition, although little was done. Hay has been our most profitable crop, with potatoes yielding well at fair prices, and apples our least profitable one, prices being very low and the outlook not good, though the fruit itself is fine and fair. The season has been about an average one for profit.

Russell (E. D. PARKS). — Indian corn is about an average crop. Root crops are up to the usual average. Farm stock is hardly up to the average in condition. Fall seeding is in good condition. Very good prices have been obtained for crops raised for market. Hay has been our most profitable crop and potatoes our least profitable one, owing to rot and low prices. Apples have been plenty, but have brought low prices. The season is about up to the average year for profit.

West Springfield (T. A. ROGERS). — Indian corn shows a heavy growth of stalk, but many ears are not filled out well. Root crops are fully up to the usual average. Farm stock is in good condition. Prices for crops raised for market have ruled from 10 to 20 per cent below the normal. Potatoes, tobacco and hay have been our most profitable crops, and apples and onions our least profitable ones. There is a diversity of opinion among farmers as to the year, some considering it profitable and others unprofitable.

Chicopee (R. W. BEMIS). — Indian corn is not quite up to a normal crop. Root crops have proved to be average crops. Farm stock is in good condition. Less fall seeding than usual has been done. Prices for crops raised for market have been fully up to the usual average. Hay has been our most profitable crop. Con-

sidered as a whole the season has been a profitable one. Farmers near the cities have great difficulty in securing good help.

East Longmeadow (JOHN L. DAVIS). — Corn is fully up to the normal. Root crops are below the usual average, owing to dry weather in August. Farm stock is in good condition. Fall seeding is in fair condition, but not as good as some years. Corn has been our most profitable crop and potatoes our least profitable one. The season has not been a profitable one, as labor has been scarce, poor and high, and the price of grain a great deal higher than the corresponding increase in the price of dairy products.

Wilbraham (H. M. BLISS). — Indian corn is 20 per cent below the normal in value, owing to poor germination, slow growth and early frost. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have been very good, with the exception of apples. Grass and potatoes have been our most profitable crops and rye and apples our least profitable ones. Considered as a whole the season has been an average one for profit.

Holland (FRANCIS WIGHT). — Indian corn is about two-thirds of a normal crop. All root crops have yielded well, but potatoes have rotted badly. Farm stock is in good condition. Fall seeding has done fairly well. Potatoes have been our most profitable crop and apples our least profitable one. Considered as a whole, the season has been a fairly profitable one.

Palmer (O. P. ALLEN). — Indian corn is rather below a normal crop. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding seems to be in average condition. The usual prices have prevailed for crops raised for market. Potatoes have been our most profitable crop and corn our least profitable one, due largely to a late season last spring, which caused much replanting. The season has been a profitable one for our farmers, but less so than some recent years.

WORCESTER COUNTY.

Dudley (J. J. GILLES). — The corn crop is fully up to the normal in value. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in fair condition. Prices for crops raised for market have ruled 10 per cent above the normal. Hay and cabbages have been our most profitable crops and potatoes our least profitable ones.

Spencer (H. H. KINGSBURY). — Corn made a good growth, but matured slowly and was damaged by frost, so that it is not above

75 per cent of the normal in value. All root crops have grown well, and except for a small amount of rot in potatoes, were profitable. Pasturage has been good and farm stock is fully in average condition. Fall seeding is in first-class condition. Many kinds of farm produce have been slow of sale, and with the exception of hay and eggs have barely brought average prices. Hay has been our most profitable crop and potatoes our least profitable one. The results of farm operations the past season appear to be about the same as those of other years.

Brookfield (F. E. PROUTY). — Indian corn is about two-thirds of a normal crop in value. Root crops are good yields. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have been about average. Hay has been our most profitable crop and potatoes our least profitable one, owing to rot and low prices. Considered as a whole, the season has been a fairly profitable one for our farmers.

New Braintree (C. D. SAGE). — Corn is a full crop in value. Root crops are better than average crops. Young cattle are looking well; cows have been fed less grain than usual. Very little fall seeding has been done. Prices for crops raised for market have been fairly good; little produced except milk. Hay, oats, corn and potatoes have been our most profitable crops, all crops being fairly profitable. The year has been a profitable one, all crops being good and prices fair, except for apples, which are in small demand. Barns are well filled.

Barre (JOHN L. SMITH). — Indian corn is an average crop. Root crops are not much raised in this locality. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have been above the average except for apples. Potatoes have been our most profitable crop, where unaffected by rot, and apples our least profitable one. The season has been a profitable one, as milk has brought a fair price and feed has been good.

Dana (LYMAN RANDALL). — Corn promised more than an average crop before the hard freeze, but many late planted fields did not dry out after the freeze, the husks stuck down and moulded at the tips, which reduces the value of the crop, so that it is not over 80 per cent of the normal. Root crops are fully up to the usual average. Stock of all kinds is in excellent condition. Fall seeding is not looking very promising. Prices for crops raised for market have not been quite up to former years. Hay has been our most profitable crop and cabbages our least profitable one. Considered as a whole, the season has been a profitable one,

Field mice did much damage to grass and destroyed many young trees last winter, and this fall are much more numerous than last year.

Royalston (C. A. STIMSON). — Indian corn is almost up to the normal in value. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in fair condition. Prices for crops raised for market have been up to the average. Corn has been our most profitable crop and apples our least profitable one. Considered as a whole, the season has been a profitable one for our farmers.

Gardner (A. F. JOHNSON). — Root crops are up to the usual average. Farm stock is in good condition. There is not much change in the prices of crops raised for market. Milk has been our most profitable product. Considered as a whole, the season has been about an average one for profit in this locality.

Fitchburg (JABEZ FISHER). — I do not think the farming interest as a whole has laid by any money without abstinence from comforts and luxuries to which it is fully entitled, considering the labor and effort expended. The profit obtained by any one class is gained from some other class, and the gain in the one case is an equivalent offset for the loss in the other. This cannot be otherwise while competition is the underlying motive of civilization. Only co-operation can make it otherwise.

Harvard (JOHN S. PRESTON). — Corn is a good average crop. Root crops are up to the usual average. Farm stock is looking well, pastures having held out well and fall feed being good. Fall seeding is in good shape. Prices for crops raised for market have been better than for some years. Hay is the leading crop here, as our farmers work for milk, and has been good, while apples have been our least profitable crop, late fall and winter varieties not paying for the barrels and work of picking. As milk has been very low in price all summer our farmers have had a hard year.

Lancaster (S. C. DAMON). — Indian corn is about two-thirds of a normal crop. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have been about the same as usual. Grass has been our most profitable crop and potatoes our least profitable one. The season has been a profitable one, except for the low price of apples.

Worcester (SILAS A. BURGESS). — Indian corn is fully up to the normal in value. Root crops, except potatoes, are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have been

lower than usual, below the average. Corn and hay have been our most profitable crops and apples and potatoes our least profitable ones. The season has been a fair average one for profit. The cold weather in September caused great damage, and high winds have done much damage to apples.

Auburn (WM. GILBERT). — Corn was about a normal crop, but suffered a loss of 10 per cent from frost. Roots have proved to be more than average crops. Farm stock is looking finely, pasturage having held out well. Grass seed sown this fall has started well and promises a good crop. Prices for crops raised for market have been low, about 90 per cent of former years. Corn and cabbages have been our most profitable crops. I think the season has been a profitable one for our farmers.

Blackstone (O. F. FULLER). — Indian corn is hardly up to an average crop. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is looking well. The prices for crops raised for market are about the same as usual. Potatoes rotted badly and the yield is not up to the standard, while some cranberry growers lost a few cranberries by the frost in September. Considered as a whole, the season has been a profitable one for our farmers.

MIDDLESEX COUNTY.

Hopkinton (W. V. THOMPSON). — Indian corn is above the average in value. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good shape. Potatoes and cabbages are not as high in price as usual, in fact all crops run a little lower. Corn has been our most profitable crop, and cabbages and squashes our least profitable ones. Considered as a whole, the season has been a profitable one for our farmers.

Marlborough (E. D. HOWE). — Corn is 90 per cent of a normal crop. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have been from 10 to 25 per cent lower than usual. Hay has been our most profitable crop and potatoes our least profitable one, on account of rot. Considered as a whole, the season has hardly been a profitable one for our farmers.

Stow (GEO. W. BRADLEY). — Indian corn is about an average crop. I should say that root crops are a little above average crops. Farm stock is in very good condition. Not as much fall seeding as usual has been done, but it looks well. Prices have ranged about as usual, some crops bringing slight increases and

others slight decreases. Corn has been our most profitable crop and apples our least profitable one. Considered as a whole, the season has been more profitable than for the last few years.

Maynard (L. H. MAYNARD). — The corn crop was normal, or above, in value. Root crops are up to the usual average. Farm stock looks well and is in good condition. Fall seeding is in good condition. Most crops have sold well and brought fair prices. Apples have sold low, but choice lots brought fair prices. Hay has been our most profitable crop and all crops have been good. Considered as a whole, the season has been a profitable one.

Groton (GEO. S. KNAPP). — Indian corn is 90 per cent of a normal crop. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is only in fair condition, the season having been too dry. Potatoes are lower than usual and apples very low, in fact prices for all crops have been lower than usual, except for early truck. Hay has been our most profitable crop and apples our least profitable one. As there is a good crop of hay and a fair crop of corn, also good crops of potatoes, squashes, oats, etc., I should say that the season had been a profitable one.

Townsend (G. A. WILDER). — Indian corn is about a normal crop. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market average about the same as usual. Potatoes, peaches and apples have been our most profitable crops. Considered as a whole, the season has been a profitable one for our farmers.

Dunstable (A. J. GILSON). — The value of the corn crop is somewhat above the normal. Root crops are above the usual average. Farm stock is in good condition. Fall seeding is in good condition and growing finely. In most cases the prices received for crops raised for market have been lower than in former years. Hay has been our most profitable crop and apples our least profitable one. Considering the high prices farmers have to pay for labor and the low prices received for the principal farm products it has not been a profitable season for farmers.

Tewksbury (GEO. E. CROSBY). — Indian corn is about three-fourths of a normal crop in value. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have been from 10 to 15 per cent lower than usual. Sweet corn has been our most profitable crop and potatoes our least profitable one.

The season has not been as profitable as either of the two preceding.

Billerica (GEO. P. GREENWOOD). — Indian corn is 90 per cent of a full crop in value. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is looking well. The prices received for most crops raised for market have been very good. Sweet corn, tomatoes and beans have been our most profitable crops. I think this has been a very good season, all things considered.

Lincoln (C. S. WHEELER). — Indian corn is not more than half a crop in value. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in fair condition. Prices for crops raised for market have been above average, except for apples. Beans, cucumbers, tomatoes and sweet corn have been our most profitable crops. Considered as a whole the season has been a fairly profitable one.

Stoneham (J. E. WILEY). — Fall seeding is in good condition. Prices for crops raised for market have been very poor. Lettuce has been our most profitable crop this season and dandelions our least profitable one. Considered as a whole, the season has not been a profitable one for our farmers.

Weston (HENRY L. BROWN). — There is little yellow corn grown and it is below the average. Beets, mangolds and carrots have been good crops; turnips have been a failure. Farm stock is always in good condition. Fall seeding has been late and is not up to the usual condition. Almost all crops have sold lower than in former years and for less than half of last year's prices. No crop has been very profitable, sweet corn as well as any and cabbages as poorly as any. Potatoes have given a fair crop, but have sold low. Squashes made a very good yield, but were injured by frost and brought very low prices. For market-gardeners and those who raise crops for market the season has not been a profitable one.

ESSEX COUNTY.

Salisbury (WESLEY PETTENGILL). — Indian corn was an average crop, but suffered somewhat from frost. Late planted potatoes rotted quite badly; other root crops average yields. Farm stock is looking well and coming to the barn in good condition. Fall seeding is very good and the early-sown is looking finely. Apples, potatoes and squashes have brought low prices; other crops compare favorably in price with other years. Hay has been our most

profitable crop and potatoes and squashes our least profitable ones. The season has not been as profitable as some years, as three of our leading crops have sold very low.

Haeverhill (EBEN WEBSTER). — Indian corn is not quite up to the normal in value. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in fair condition. Prices for crops raised for market have been less than last year. Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole the season has been a fairly profitable one with our farmers.

Newbury (GEO. W. ADAMS). — Corn is a fair average crop and owing to the rise in price is slightly more valuable than usual. Root crops are up to the usual average. Farm stock is in from fair to good condition. Fall seeding is in average condition. Tomatoes bring an increased price, owing to scarcity, other crops about the same, the advance, if any, being very slight. Onions have been our most profitable crop and hay and apples our least profitable ones. Considered as a whole the season has not been a profitable one. Apples give in many cases a loss. Labor continues to advance in cost and deteriorate in quality. Thousands of dollars worth of crops in this county will go to waste simply because the product of a day's labor will not pay the workman.

Rowley (DANIEL H. O'BRIEN). — Corn is about half a crop in value. Root crops are up to the usual average. Farm stock is in very good condition. Fall seeding is quite satisfactory. Potatoes and squashes have been our most profitable crop and corn our least profitable one. Considered as a whole, the season has been a profitable one. Many fields of potatoes have rotted badly in portions, while in other parts of the same field they have not rotted at all.

Andover (MILO H. GOULD). — Corn has been an average crop. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market were low the first of the season, but are better now. Sweet corn, strawberries and cucumbers have been our most profitable crops and potatoes our least profitable one. Considered as a whole, the season has been fairly profitable.

NORFOLK COUNTY.

Stoughton (CHAS. F. CURTIS). — Corn is fully up to a normal crop in value. Root crops are up to the usual average. Farm stock are in good flesh and in good order. Fall seeding when put

in early has made a good catch. Prices for crops raised for market have been a little under the average. Hay has been our most profitable crop and potatoes our least profitable one. The season has been a very profitable one on the whole.

Canton (EDWIN V. KINSLEY). — The corn crop is above the average, much of that sown being for the silo or to be fed green and making very heavy growth. Root crops are up to the usual average. Farm stock is in good condition and the supply of milk has been ample to date. Prices ruled very high the first part of the season and are about average at the present time. Fall seeding is somewhat backward, although the Indian summer weather of the past week has improved it. Cabbages and onions have been our most profitable crops, and sweet corn, potatoes and apples our least profitable ones. Considered as a whole, the season has been about an average one for profit.

Norwood (F. A. FALES). — Indian corn is three-fourths of a normal crop in value. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in fair shape. Prices for crops raised for market have been lower than usual. Potatoes have been our most profitable crop and peas our least profitable one. Considered as a whole, the season has not been a profitable one, owing to low prices.

Millis (E. F. RICHARDSON). — Indian corn is a good crop. Root crops are below the average. Farm stock is in good condition. Fall seeding is in fair condition. Prices for crops raised for market have been better than usual. Grass has been our most profitable crop and potatoes our least profitable one. Considered as a whole the season has been a profitable one for our farmers.

Walpole (EDWARD L. SHEPARD). — Indian corn is about a two-thirds crop. Root crops are below the usual average. Farm stock is in fairly good condition. Fall seeding is in normal condition. Prices for crops raised for market have been about the same as in former years. Hay has been our most profitable crop and potatoes and corn our least profitable ones. The season is not up to the normal in profit.

Foxborough (E. A. MORSE). — Indian corn is above a normal crop and more raised than usual. Roots are about average yields. Farm stock is in good condition. Fall seeding is looking finely and more than usual has been done. Prices for crops raised for market have been above the average of the past few years. Potatoes have been our most profitable crop. I do not hear much complaint, so should say that the season had been a good one financially.

BRISTOL COUNTY.

Easton (H. M. THOMPSON). — An early frost damaged the corn crop considerably, preventing it from being more than a normal crop. Root crops are up to the usual average, as a whole. Farm stock will enter winter quarters in good condition. Early seeding is looking very promising. Prices for crops raised for market are fully up to the usual average. Hay and cucumbers under glass have been our most profitable crops and certain garden crops our least profitable ones. The season has been a profitable one for our farmers. Eggs bring 36 cents per dozen at the door.

Attleborough (ISAAC ALGER). — Indian corn is about 90 per cent of a normal crop in value. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in excellent condition. Prices for crops raised for market have been fully as good as usual. Potatoes have been our most profitable crop. Considered as a whole, the season has been a profitable one for our farmers.

Dighton (JAMES N. PAUL). — Corn is not over half a normal crop in value. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have ruled lower than usual. Strawberries, asparagus and potatoes have been our most profitable crops and tomatoes, squashes and cabbages our least profitable ones. Considered as a whole, the season has not been a profitable one for our farmers.

Swansea (F. G. ARNOLD). — The stand of Indian corn was very poor owing to poor seed, but a very good crop resulted. Root crops are up to the usual average. Farm stock is in very good condition. Fall seeding is in very good condition. Cabbages have brought low prices and potatoes fair prices. Potatoes and onions have been our most profitable crops and cabbages and tomatoes our least profitable ones. The season has not been a profitable one in this section, owing to the poor market caused by the strike in Fall River.

Dartmouth (F. H. MOSHER). — Indian corn is about a normal crop, except the late planted. Farm stock is in fair condition. Root crops are below average in yield and of poor quality. Fall seeding has much improved in the past two weeks. The prices for crops raised for market average slightly above those of the two preceding years. Hay and forage crops have been our most profitable crops and potatoes our least profitable one, some fields rot-

ting so badly that they were not harvested. As a whole the season has been less profitable than the average on account of drought, early frosts and insect pests.

Acushnet (M. S. DOUGLAS). — The corn crop was very late and the early frosts damaged it to such an extent that it is not over two-thirds of a normal crop. All root crops except potatoes have turned out well. Farm stock is in good condition. Fall seeding is in good condition, but is backward. Prices on all products have been lower than usual. Hay has been our most profitable crop and potatoes our least profitable one, owing to a light crop and low prices. Turnips and celery not yet harvested but looking well, prices very low. I do not think that the season has been a profitable one for our farmers.

PLYMOUTH COUNTY.

Hingham (AARON LOW). — The corn crop did not ear out well and is below the average. Root crops have not been up to the average in this section. Farm stock is in first-class condition, pastures having been unusually good. Fall seeding has come up well and is growing finely. Cabbages have not headed out well. Prices for crops raised for market have been a fair average. Potatoes are our most profitable crop and cabbages our least profitable one, almost a total failure. The season has not been more than an average one for profit.

Norwell (H. A. TURNER). — Indian corn is about two-thirds of a normal crop. Root crops are good, but potatoes have rotted somewhat. Farm stock is in good condition. Fall seeding is fairly good. Prices for crops raised for market have been about the same as usual. Hay and cauliflowers have been our most profitable crops and potatoes and apples our least profitable ones. Considered as a whole, the season has been a fairly profitable one for our farmers.

West Bridgewater (C. P. HOWARD). — Indian corn is not quite up to the average. Potatoes have rotted badly. Stock comes in from the pastures looking well. Fall seeding is looking well. Market gardeners have complained of low prices for their crops. Potatoes have been our most profitable crop and onions and corn our least profitable ones. This is about an average season for profit with most farmers.

Pembroke (NATHANIEL MORTON). — Indian corn is below the normal in value. Root crops are not up to the usual average. Farm stock is in about the usual condition. Fall seeding is in very

good condition. Prices for crops raised for market have been better than usual. Potatoes have been our most profitable crop and apples our least profitable one. Considered as a whole, the season has been a fairly profitable one for our farmers.

Halifax (G. W. HAYWARD). — Corn is about an average crop. Root crops are up to the usual average. Farm stock is in good condition, better than for a long while. Early fall seeding looks finely. Prices for potatoes are low, the market being glutted for fear of rot, but other crops bring about the usual prices. Hay has been our most profitable crop and corn our least profitable one. The season has been a fairly profitable one, no crop having been a general failure.

Kingston (GEORGE L. CHURCHILL). — Corn is about four-fifths of a normal crop. Root crops have proved to be fairly good. Farm stock is in very good condition. Fall seeding is in very fair condition. Prices for crops raised for market have been up to the standard of former years. Potatoes have been our most profitable crop and turnips our least profitable one. The season has been a peculiar one, but most crops have grown well, and the season has been as profitable as usual.

Rochester (GEO. H. RANDALL). — Indian corn is about two-thirds of a normal crop. Root crops are up to the usual average. Farm stock is in very good condition. Fall seeding is in very good condition. Prices for crops raised for market have been lower than usual. Potatoes and onions have been our most profitable crops and corn our least profitable one. The season has not been quite satisfactory from the standpoint of profit. The early frost damaged corn and cranberries. Apples plenty and prices low.

BARNSTABLE COUNTY.

Falmouth (D. R. WICKS). — Corn will compare favorably with a normal crop. Root crops, so far as harvested, are up to the usual average. Farm stock is in fine condition, as there is good fall feed and plenty of it. Fall seeding is looking well. Prices for crops raised for market have been a little better than usual in most cases. Potatoes and hay have been our most profitable crops and peas and beans our least profitable ones. Taken as a whole I think the season has been a profitable one.

Mashpee (W. F. HAMMOND). — The corn crop is below the normal in value. Root crops are up to the usual average. Farm stock is in good condition, rather above the average. Prices received for crops raised for market have been above the average.

Hay has been our most profitable crop and cranberries our least profitable one, being damaged by a late June frost and early September one. The season has been about an average one for profit.

Barnstable (JOHN BURSLEY). — Indian corn is about 85 per cent of a normal crop, the early frost injuring grain and stover. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices for cranberries, our staple crop, are 20 per cent less than in 1902 and 1903, — prices for other crops much the same as usual. Cranberries have been our most profitable crop. Considered as a whole, the season has been a profitable one for our farmers.

Dennis (JOSHUA CROWELL). — Indian corn is about a normal crop. Root crops are hardly up to the usual average. Farm stock is in very good condition. Fall seeding is in good condition. Prices for crops raised for market have been about average, rather less than more. The cranberry crop, which is perhaps the main crop in this section, suffered severely from a late frost in June and from frosts of unprecedented severity in September, and at the same time low prices have been received, so that the outcome is far from satisfactory. I think the season has hardly been an average one for profit.

Brewster (THOS. D. SEARS). — The corn crop is fully up to the average. Root crops are not up to the usual average. The condition of farm stock is good. Fall seeding is fully average in condition. All crops except cranberries are bringing prices fully up to those received in former years. Cranberries have been our most profitable crop and onions our least profitable one. The season has not been a profitable one for our farmers.

Eastham (J. A. CLARK). — Root crops are not up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have been a fair average with former years. Asparagus has been our most profitable crop. Considered as a whole the season has been a profitable one for our farmers.

BULLETIN OF MASSACHUSETTS BOARD OF AGRICULTURE.

BEE KEEPING: HOW TO MEET ITS DANGERS AND DIFFICULTIES.

By BURTON N. GATES, with suggestions from Prof. C. F. HODGE.

Massachusetts produces less than one-fourth of the honey consumed in the State. The past year this amount was approximately 200 tons, of which 15 tons came from Vermont and upward of 145 tons from California. With a population of 2,805,000 this would give 0.14 of a pound, or less than two tablespoonfuls of honey per person as a year's ration.

The average yield of honey per colony in the above named States in 1900 was as follows:—

	Pounds.
Vermont, ...	14.2
Massachusetts, ...	13.0
California, ...	28.3

while in Texas, which produced the largest amount of any one State, the yield per colony was only 12.2 pounds.

These averages are all low and must be considered to mean, in the main, inefficient management, yet the colonies in California are being handled more generally according to modern and improved methods. Not infrequently well-managed apiaries in Massachusetts produce from 30 to 50 pounds, and yields of over 100 pounds of surplus comb honey are not rare. With the adequate development of the industry there is no doubt that Massachusetts could produce all the honey annually consumed within the State, and even beyond that amount, without straining the limits of our natural resources.

We have been requested to make this article supplement somewhat the excellent paper, "Bee Keeping, its Pleasures and Profits," by Prof. James B. Paige.* In order that we may enjoy the "pleasures and profits" of bee keeping it is certainly needful that we be armed and equipped to meet the difficulties and prevent the losses which sometimes threaten the industry.

With a capital value in 1900 of \$10,186,000, for the United States as a whole, the bees returned as profits and wages products to the amount of \$6,665,000. This is about 65 per cent interest on the investment, and

* Massachusetts Crop Report, July 31, 1903; also Agriculture of Massachusetts, 1903, pp. 399-411.

returns of 100 to 200 per cent are sometimes realized in special cases of good management and favorable conditions. The large returns indicate that bee keeping is an industry which liberally rewards intelligent effort, and there is no agricultural pursuit in which accuracy and the determination to do everything required at exactly the right time counts for so much. No similar industry yields such large rewards and no occupation is more exacting in the matter of promptness when anything needs to be done. Unless we are sure of being able to do each part of the work at the proper season we should not attempt bee keeping.

WINTERING BEES.

Of all the dangers and difficulties confronting the bee keeper that of wintering his bees in this latitude and climate, with its sudden changes, was brought most closely home to many this past winter. Some lost every swarm, others eighty per cent. The man who successfully brought through to spring fifty per cent or more of his colonies is indeed to be congratulated. But the extreme and prolonged cold was not the chief cause of this excessive loss. Bees have been known to winter safely under all manner of conditions; in stone jars, thin wooden shipping boxes both shallow and deep, in glass hives and even in hives with no bottom to prevent the wind from sweeping up between the combs. Yet the bees must have maintained their normal temperature. Something besides outside protection is necessary to the successful wintering of bees. Certainly one of the necessities of successful wintering is plenty of food, chiefly honey, although Cheshire* states that pollen is essential to strong wintering. He says: "Honey the bees consume to enable them to produce heat and give forth energy, and pollen to renew their nerve and muscle waste, selecting the one or the other as nature needs." These foods, it has been demonstrated by experiment, are best arranged in the hive by the bees themselves, and not supplied by slipping into the cluster late in the fall a frame or two of honey. This may act like a division board and separate the cluster. In order to avoid the need of doing this, if a swarm is weak in the fall, feed the bees early in September a syrup of sugar and water, half and half, or extracted honey if you have it. The bees will then deposit the food where they can use it when clustered in winter.

Another factor of extreme importance is a population of young thrifty bees in a colony. Bees which have worked all summer, gathering honey and raising brood, are worn out, and cannot survive the winter if they do the fall. During the winter bees are quiet, there is no wear and tear upon them. They merely hang in a compact cluster within the brood nest, moving about only enough to procure food from time to time. Thus young bees, when winter sets in, are capable of resting throughout the cold months, being fresh when spring opens up.

To summarize: the two essentials are, have plenty of naturally arranged stores, with plenty of young bees. Bees enough to cover six standard Langstroth frames will usually winter well.

* Frank R. Cheshire, "Bees and Bee Keeping," Vol. II., p. 525, London, England.

Besides these essentials some protection for the outside of the hive is desirable. It has been customary for years to winter bees in long, low sheds or tenement hives. These are expensive and cumbersome and are apt to harbor mice, which sometimes destroy the bees. Better satisfaction is generally obtained by the use of chaff or double walled hives. Still further in the direction of simplicity, Mr. Arthur C. Miller, of Providence, R. I., has worked out the plan of wrapping the hives in four or five thicknesses of paper, covering top, sides and ends. Tarred roofing paper is preferred for the outside layer because waterproof and black, the color serving to absorb heat. Mr. Miller has found that bees may be wintered safely in any single-walled hive, even a quarter inch in thickness, with this simple protection. The paper is held in place by strips tacked around the bottom.

Cellar-wintering is another method, little practised in Massachusetts, yet of great value in Canada or the West. After being in some disrepute for several years, it is now coming to the front again as a successful method for cold and exposed locations. A dark, dry cellar, with good ventilation, in which the temperature can be kept at about 45° F., is suitable for the purpose. The hives are set on timbers, with the bottom board removed for ventilation. They are put in after settled cold weather begins in the fall and are not brought out until spring is well arrived, many leaving the bees in winter quarters until the first of May.

THE BEE MOTH OR "WAX WORM."

Probably the greatest of all losses to bee keepers in the past have been caused by this insect. It is said to have been chiefly responsible for the decline in bee keeping during the past century. In the earlier days of the industry in America farmers kept their colonies in any receptacle, regardless of uniformity. Sometimes bees were hived in straw skeps, as was the old custom in Europe; more frequently they were kept in old boxes of odd dimensions, or even in barrels or kegs. Again, if a swarm was found wild in the woods, the tree was sawed off above and below the colony, and this section was then taken home and set up among the boxes and barrels. Such an apiary certainly could not present the neat appearance of the modern uniform hives. When honey was taken the whole colony had to be sacrificed, being usually "brimstoned." In such hives, if the wax worm gained entrance, the colony was usually beyond recovery before the owner knew what was going on. Even later in the century, when bees came to be kept generally in uniform "box-hives," there was no way of gaining access to the combs and hence the wax worm could be controlled no better than in the hollow log. The moth increased unchecked, and until the movable frame hive was invented, nothing could be done to save the industry.

At bottom the difficulty was that bee keepers did not study their enemy and from a knowledge of the life history of the bee moth discover some means of checking its attacks. Even at present, with all the devices which make the control of the pest so easy, no bee keeper is safe who cannot recognize the insect at a glance in any of its different stages.

The moth is about three-fourths of an inch in length, dull, ashy gray, streaked in imitation of a weathered chip and may be seen flitting rapidly about the entrance of the hive at dusk. The life history of the bee moth may be briefly sketched as follows. The moth deposits her spherical white eggs singly about the entrance or in the crevices of the hive, inside, if she can gain admittance. As soon as the caterpillar hatches it begins feeding on the combs, where it tunnels along the midrib, the tunnel or gallery increasing in size as the larva grows. It thus burrows through the bases of the cells, possibly destroying great numbers of eggs and young bees, and as it goes it lines its passageway with a tough, silken web. In three or four weeks the caterpillar attains its growth and is about one inch in length. It then withdraws to some secure crevice, often gnawing a cavity in a frame or in the sides of the hive, and there spins a strong cocoon. In this it changes into a pupa and after from ten to fourteen days emerges as the adult moth, ready, after mating, to repeat the life cycle.

If the caterpillars gain entrance to a hive early in the season, and produce four broods before winter, as is usual in this State, it is to be expected that a colony will be much weakened from loss of young bees, and will not be able to survive the winter. This was the condition in the old-fashioned hives in which so many colonies were destroyed. These were left about the farm, a mass of webs and cocoons, which acted as a breeding place for the whole neighborhood. Had the farmers known the nature of the pest they could have easily saved much further infestation by merely destroying the old combs and hives as fast as the bees died.

To-day, however, things have changed, the ravages of the moth are checked, so that in some States it is nearly exterminated. This has been brought about mainly by the improved hives, with movable frames, which enable every part of the colony to be examined. Even with such facilities the common black or German bee, of which we will speak later, requires constant attention. The hive must be opened at least once in eight or ten days, and whenever the wax worms have gained a foothold the caterpillars can be traced in their galleries, and with a long pin or knife blade can be cut out or killed. Even with this constant attention infested black bees are frequently lost. From this it may readily be seen how impossible the task of fighting wax worms was years ago in the old box hives.

An equally important move toward controlling the bee moth was made when the United States Department of Agriculture introduced Italian bees into this country. Fortunately these and some of the still more recently introduced races do not tolerate the presence of a wax worm in their combs. Wherever the bee moth exists, and we regret to say that this probably includes all of Massachusetts, simply requen with Italian or other moth-proof strain and the battle is won.* Hence by the use of

* For the method of introducing new races or strains of bees in your apiary, refer to some of the standard works on bee culture, under head of "Introducing Queens." Many of these works were mentioned at the close of Professor Paige's article.

modern hives and superior races of bees, the bee moth problem entirely disappears as a difficulty. In reality, if this pest serves as a means of improving methods and stock, it should be looked upon as a blessing in disguise.

ROBBING.

This is a real and serious difficulty, to avoid which the bee keeper should carry with him an ounce of prevention and use it all the time. As Mr. Root expresses it, "A stitch in time will save a great many more than nine in this case." Phrasing the proverb to suit the bees, the love of honey is the root of all evil. Generally robbing may be traced to honey spilled or left carelessly where bees can get at it during a time of scarcity or honey famine. The difference between preventing any access to honey and stopping the riot, when an apiary is in an uproar of robbing, may be likened to that of putting out a match and a conflagration.

Robbing may be detected by the high-keyed, angry tone of the bees and their quick and nervous flight. Great apparent uproar and confusion among the bees is sometimes occasioned by the young bees swarming out for their daily play spell. Beginners often mistake this for robbing, but the mild and joyous hum of the bees and the absence of fighting about the entrances should serve to distinguish between the two. When we discover the hive that is being attacked we shall probably find bees fighting at the entrance and heaps of dead around the alighting board, while others are trying to gain admittance through cracks about the hive. They are likely to be cross and to sting promiscuously, causing injury to stock and annoyance to passers by.

To prevent robbing we must never have honey about in any form, the taste of which may start the craze. Avoid opening hives as much as possible during periods of honey scarcity. Keep all colonies strong if possible, and, when honey is not coming in, contract the entrances of the weaker swarms to the width of one or two bees. Lastly, and most important of all, keep only "civilized" bees. Here is another reason for improving stock. A small nucleus of Italian bees or of the other improved races will successfully defend their hives, under conditions in which a moderately strong swarm of black bees would be overpowered.

If robbing has begun, immediately contract the entrances of the hives attacked to the width of a single bee and throw a handful of weeds over it to further confuse the enemy. If robbing bees are numerous it is also well to smoke them vigorously. In cases of persistent robbing, the plan of exchanging the greater part of the frames of the two hives concerned is sometimes to be recommended.

BEE DISEASES.

We now come to the grim part of our theme. For a man to say that the bee moth has injured his apiary is a frank admission of ignorance or neglect on his part. For him to bewail his afflictions from robbing marks him as one who is careless if not slovenly in his methods. For him to say that his bees have foul brood carries as yet no stigma, for we

do not know how it originates or where it comes from. This tells us simply that he is unfortunate.

- Brood diseases and dysentery were known in the days of Aristotle. Baron Dyerzon, in 1848, lost his entire apiary of 500 colonies from an epidemic of disease.

A condition commonly called dysentery sometimes appears in an apiary, generally among the weaker swarms, especially in the early spring or after a long period of confinement of the bees within the hives. Bees normally void all excrement on the wing and outside the hive, but under the above conditions they may soil the hive, combs and one another with yellowish-brown stains. This may go on until the whole colony perishes, a mass of mouldy bees in the bottom of the hive.

Of course a good many bees may die, especially in unfavorable weather, of old age and weakness in the early spring, and we should not be surprised to find possibly a quart or two dead in front of a hive at such times. I have never known it to go farther than this unless the entrance became clogged with dead bees. Generally, if the bees are able to fly freely for a day of bright, warm weather, the trouble disappears, and with a little help in scraping the bottom board, etc., the bees clean up the hive in short order. This is generally done as a matter of course during the first warm days of spring, when the bees begin to fly. In exceptionally bad cases, it may be advisable to shake the bees onto clean combs in a clean hive.

In severer cases bad food, especially honey made by the bees from "honey-dew" is probably at the root of the difficulty. Honey-dew is excreted by aphids or plant lice, which often cover the leaves of trees in dry seasons with a sweetish substance, giving them the appearance of being varnished. Bees do not ordinarily collect this, if they can find nectar in the flowers, but as a last resort in seasons of scarcity they may attempt to use it for winter stores. As stored in the combs, such honey is commonly very dark and has a nauseating taste. Careful bee keepers in preparing the bees for winter generally remove the frames containing such honey and either feed sugar syrup or supply, in good season and carefully placed, combs of clean and wholesome honey.

In this connection a word of caution is in order against allowing bees to soil washings on the line. With bees in cities this nuisance often causes ill feeling among neighbors. To prevent this simply confine the bees on wash days or until all clothes within the danger line, say within a radius of a hundred feet, are taken in.

By far the most serious diseases of bees are those which attack the brood. They may occur any time in the summer and are known under the popular names of "foul brood," "pickled brood," "bad brood," "black brood" or "the New York bee disease," and so on. Of these, the differences, if any, are so slight and technical that we cannot here consider them. For simplicity then, we will speak of the brood disease which has gained a firm hold in certain localities of Massachusetts as foul brood.

A foul brood colony in a neighborhood should be regarded as dangerous to the bees as a case of smallpox is to man. The strictest laws

should protect bee-men from the possible contagion through neglect of a diseased colony by some thoughtless neighbor. Massachusetts affords no such protection, unfortunately, as is secured in New York, Michigan and other States. In New York, inspectors, one to each of the four divisions of the State, have been appointed by the State Department of Agriculture, to visit everybody who keeps bees. Wherever a bad colony is found it is either treated and cured or destroyed, according to the discretion of the inspector. The result is that fewer cases of foul brood, or as they term it black brood, have been found this year than last. It is expected by this means to stamp it out entirely within a few years.

Although the disease is not so general in Massachusetts it is here and will surely spread if some efficient measures are not taken to stop it. We need a live State Bee Keeper's Association, with branch societies in every county. Then by a vigorous effort of our combined forces we may insure protection and cure.

The first signs of the disease are, — failure of the young bees to hatch, dead larvæ are dragged from their cells, capped cells are sunken or torn open. Later as the disease progresses putrefaction sets in, the once milk-white larvæ turn yellow, then brown and black, and sink, a slimy mass, to the lower side of the cell. These putrid larvæ have sometimes a characteristic "glue-pot" smell and are viscid and ropy, characteristics which are not constant, and which have for this reason caused people to believe there are many kinds of foul brood. If the dead larval mass is allowed to remain in the cell, it dries down to a chip or scale, which closely adheres to the wall. The next larva raised in that cell comes in contact with the disease and dies, and thus the colony dwindles away.

The cause of the disease is definitely known to be a bacterium, *bacillus alvei*, a microscopic plant. It lives upon the tissues of the larval bee, and when mature breaks up into spores, also microscopic, capable of living a long time under all sorts of conditions of temperature and dryness. The spores correspond to the seeds of higher plants, and they are found not only in the cells where the brood has died, but also in the honey, pollen, and upon the walls of the hive. Thus it is important that no material from a diseased swarm comes in contact with healthy bees.

This may be prevented by isolating a diseased swarm as soon as discovered. If the swarm is weak it may be best to burn the bees and disinfect the hive. If strong they may be cured by the following treatment, which has been practised with success. Open the isolated colony toward night when danger of spreading the disease by means of robber bees is past, shake the swarm from the infected combs onto fresh frames of foundation in a clean hive. Return the new hive to the old stand and allow the bees to use up what honey they have in their honey sacs, drawing out the foundation. As soon as the bees begin to drop from the frames from starvation you may begin to feed, but not before. By this means none of the honey carried from the old hive is deposited in the new cells. Bees treated thus are usually cured.

Further care must be taken to destroy the germs in the old hive. Cheshire says: "The destruction of the hive is never necessary. It

may be used again with perfect safety, if, having been washed and dried, it be scrupulously painted with a mixture of two parts methylated spirit and one part carbolic acid crystals, or one and one-half parts good white fluid carbolic acid. This mixture not only destroys all bacilli, but it glues them down by dissolving the propolis." For washing corrosive sublimate solution (Mercuric chloride), one-eighth ounce in a gallon of water, may be used to advantage. A thorough rinsing must follow.

Fumigation of the hive with formaldehyde gas has been advocated, but recently this has not been found to penetrate the wax and honey sufficiently to kill all germs. A better method is to extract the honey and melt up the combs. Heat these for an hour or so as high as possible without burning. This will kill all germs. Then run off the wax, which may be again used. The honey also is rendered wholesome for either man or bees.

After handling diseased colonies the hands and all tools must be thoroughly disinfected before permitting them to touch healthy stock.

So far as we know every case of foul brood arises from infested bees in the neighborhood. A hive dies out, the owner neglects to examine it, possibly does not know that it is dead, but other bees rob it out and carry the germs wherever they go. Thus, like an epidemic in a city, the disease spreads until checked. When brood disease strikes in, the only hope of saving the industry in a neighborhood lies in prompt and energetic action on the part of every bee keeper.

The main difficulties of bee keeping have been considered and none of them are insurmountable. A few minor dangers remain to be briefly noticed.

Spraying trees during fruit bloom has caused severe loss in some sections, by poisoning great numbers of bees. Spraying at this time is never necessary and is prohibited by law in some and should be in all States. The direction given by Prof. M. V. Slingerland in Cornell Experiment Station Bulletin 142, p. 58, "*The Coddling Moth*," is, — "*never spray a fruit tree when it is in blossom*. You can reach the insect and fungous enemies as effectively, and in some cases more so, either just before or just after the trees bloom." You may then be certain of poisoning no bees.

Mice and rats have a sweet tooth and if allowed to will work havoc in an apiary in winter. This may be prevented by tacking over the entrances wire mesh of proper size, not to prevent the passage of bees, but to keep out the mice. All surplus combs or honey must be stored in mouse-proof rooms or boxes. A better way still is to completely rid the premises of all such pests and then keep traps well baited and set the year around. Place no dependence on cats to do the job thoroughly enough, and with the pests once inside the hives the cats cannot get them.

The king bird is commonly supposed to feed upon bees, the name "bee-bird" or "bee-eater" being commonly applied to it in some sections. Examinations of 281 stomachs of birds shot feeding about apiaries revealed, however, the remains of only 4 worker bees, 40 drones and a number of robber flies which are known to prey upon laden workers.

Thus the king bird must be accounted an active friend of the bee keeper.

Toads sometimes take a few bees about the entrances of the hives. The remedy for this is to raise the hive a few inches from the ground and provide a generous alighting board.

IMPROVED STOCK.

In bee keeping, as in other lines of husbandry, in addition to intelligent care, "*improved stock*" is the watchword of success. We have already seen that the dangers connected with the bee moth, with robbing and even with wintering may be reduced to a minimum by attention to this point. Most of the difficulty of handling "cross" bees may be met in the same way, and this is no small matter with beginners, amateurs and those who keep bees in towns or cities.

For nearly fifty years the United States Department of Agriculture has been searching the world over to discover superior races of bees and has imported and tested a number of them. As a result we now have the following races (except *Apis dorsata*), the comparative advantages of which may be seen at a glance from the table given below. Ten indicates highest excellence and so on down.

*Comparative Value of Different Races of Bees.**

RACE.	Gentle- ness.	Honey Gather- ing.	Resist- ance to Bee Moth.	Winter- ing.	Prolific- ness.	Swarm- ing.	Length of Tongue.	Total Points.
Black, . . .	5	6	4	8	5	6	6	40
Italian, . . .	8	8	8	6	7	8	8	53
Carniolan, . . .	9	8	8	10	9	10	8	62
Cyprian, . . .	7	10	10	7	10	8	10	62
Dorsata,† . . .	7	8	?	?	8	3	10	33?
Caucasian, . . .	10	8	8	8	9	8	?	51?

From the rating in the table we see that probably no one would keep black bees, if he knew better. Further than this, anyone who keeps black bees in a locality endangers the purity of his neighbor's stock. In most sections of the State this constitutes the greatest difficulty connected with the maintenance of pure high grade bees, since the black bees are likely to produce great numbers of drones which mate with the virgin queens of other races. The hybrids resulting from this cross are sometimes vigorous bees and good workers, but are likely to be the meanest bees to handle that we have. The practical impossibility of controlling

* See "Nature Study and Life," Ginn & Co., 1902, p. 241. This table gives Professor Frank's latest rating, including also the Caucasian race, under date, July 17, 1904.

† This is *Apis dorsata*, Fab., the giant honey bee of East India. All attempts to import it having failed, little is known concerning its relative value. It builds huge combs five or six feet in length and three or four feet wide attached to overhanging ledges or to branches of lofty trees.

the moth where black bees are kept should alone suffice to relegate this race to the back woods.

The Italian bees have been popular since their introduction in 1860. They are a large, light-colored bee, readily distinguished from the black by having at least the first three bands of the abdomen yellow or leather-colored. They are quiet and gentle and hence easily manipulated. They cling to the combs, when these are lifted from the hive and thus the queen may be readily found at any time. In resistance to bee moths, prolificness, honey production and other valuable qualities, the Italian bees are seen to be far superior to the blacks. The race has so long almost monopolized the attention of progressive apiarists that a number of superior strains have been produced by careful breeding and selection.

The Carniolan bees were imported from the Alpine province of Carniola in 1884. They are large ashy gray bees with silvery white hairs, very beautiful and gentle. Professor Benton calls them "ladies' bees," and they are especially recommended to beginners or children. Carniolans cap their honey extremely white, they winter best of any race, they do not tolerate the moth in their hives, they are industrious, working especially well on late flowers, and they are very prolific. About the only questionable quality of the Carniolans is said to be their excessive swarming, but this may be largely controlled by proper shading and by giving plenty of room in the hives.

The Cyprian bees, introduced from the island of Cyprus, are a small slender bee with three bands of the abdomen yellow above and all the segments, often to the tip of the abdomen, yellow underneath. They are industrious and energetic and hold the record over all other races for honey production, 1,000 pounds having been secured from a single swarm (spring count) in a season. They may often be observed actively at work while other bees are "loafing." It is said that they never molest anyone passing or working among the hives unless the hive itself is disturbed, when they become the fiercest and most persistent of fighters. They protect their hives better than other races from bee moths, robber bees and all other intruders, but on this account they have gained a reputation for viciousness in handling, which, from my own experience with stock obtained directly of Mr. Benton, I think they do not deserve. They were easily reduced to subjection with smoke and could often be handled without it. In point of prolificness the Cyprians are truly phenomenal. My experience with a single swarm does not permit me to speak in general terms, but I introduced the queen in a very weak colony in June and by the middle of July it had become a veritable volcano of bees, swarming daily and persistently in spite of cutting out of queen cells and the removal of numerous extra queens. A large amount of honey was evidently produced, but it was practically all used for rearing bees and no surplus was obtained from this colony. At present writing I cannot recommend Cyprian bees for Massachusetts, but further experiment may change this opinion.

With regard to the newly introduced Caucasian bees, Mr. Benton writes, under date of July 6, 1904. "I feel pretty safe in calling the Caucasians a valuable addition to our races of bees. They are indus-

trious, prolific, and the gentlest of any bees with which I am familiar, not even excepting the Carniolans. They have wintered successfully in comparison to other races in the latitude of Denver, Colorado, and have not here (Washington, D. C.) shown themselves inferior in wintering qualities to ordinary strains of Italians. We may thus hope for good reports in the near future."

Much attention is now being devoted to discovering or breeding a strain of bees with tongues long enough to reach the nectar in the flower tubes of red clover. In 1900 the A. I. Root Co. offered a prize for the bees having the longest tongues. This was awarded to Mr. J. P. Moore of Morgan, Ky., whose bees were found to have tongues measuring $\frac{23}{100}$ of an inch in length. (Ordinary bees measure but $\frac{16}{100}$.) This length of tongue enables the bees to secure nectar from most of the flower tubes of red clover and thus to fill their hives with honey that common bees cannot reach. Cross fertilization of the red clover by these bees is likely to prove an important item, for which we are now dependent upon the bumblebees. The problem of "red clover bees" is certainly worthy of attention on the part of Massachusetts apiarists.

In order to put bee culture on a secure footing in Massachusetts we need first of all a live and united association which shall reach practically everyone who keeps bees in the State. The purpose of such an organization will be to stamp out brood diseases and keep them out of the State, then to work hard for a few years to secure the general adoption of modern methods and the maintenance of improved stock. This should place the industry beyond the reach of the bee moth at least. The association may find it necessary also to secure adequate legislation for protection of the industry. Another need of the State is a model plant at Amherst and a strong course in practical apiculture. This, which we are glad to note has already made a beginning, should grow to be the co-ordinating head and the strong right arm of the association. It should become the centre in the State for needed instruction, for proper inspection and development of the industry, for all manner of investigation and experiment, and, possibly, a depot for distribution of the best obtainable stock.

While our subject is not, possibly, a cheerful one, still to be forewarned is to be forearmed. Most popular writings present the subject in all its most rosy lights, and this ought to be so; for no other branch of industry has the charm, the fascinating and absorbing interest which keeps people young and happy and tingles in the blood like a veritable fever of delight, when once a mastery of the difficulties of successful bee culture has been attained. And we have thus briefly presented some of its chief dangers and difficulties in the hope that more people may come to enjoy its many "pleasures and profits."

